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A

SUMMARY ACCOUNT

OF

REWARDS

BESTOWED BY THE

SOCIETY,

FROM THE YEAR M D CC LXXV.

TO THE

YEAR M D CC LXXXII.

INCLUSIVE;

ARRANGED UNDER THE SEVERAL CLASSES OF

AGRICULTURE, CHEMISTRY, COLONIES AND TRADE, MANUFACTURES, MECHANICKS, POLITE ARTS, AND MISCELLANEOUS ARTICLES,

WITH

ORIGINAL PAPERS COMMUNICATED TO THE SOCIETY.

AGRICULTURE.

Rewards beſtowed by the Society for Planting and Huſbandry, from the Year 1775, *to the Year* 1782, *incluſive.*

PLANTING TREES FOR TIMBER.

1775 ACORNS. To the Rt. Hon. Earl Winterton, Shillinglee Park, Suſſex, 14269 Plants, THE GOLD MEDAL.

ASH. To William Woolaſton, Eſq; Great Finborough, Suffolk, 20 Acres, The GOLD MEDAL.

LOMBARDY OR PO POPLAR. To the Rt. Hon. Earl Winterton, Shillinglee Park, Suſſex, 2613 Plants, THE GOLD MEDAL.

1776 LOMBARDY OR PO POPLAR. To Richard Muilman Trench Chiſwell, Eſq; Debden Hall Eſſex, 11000 Plants, THE GOLD MEDAL.

1777 ELM. To Richard Muilman Trench Chiſwell, Eſq; Debden Hall, Eſſex, 1945 Plants, THE GOLD MEDAL.

1778 LOMBARDY OR PO POPLAR. To Thomas White, Eſq; Weſt Retford, Nottinghamſhire, 10400 Plants, THE GOLD MEDAL.

LARCH. To Thomas White, Eſq; Weſt Retford, Nottinghamſhire, 13000 Plants, THE GOLD MEDAL.

SCOTCH FIR. To Thomas White, Eſq; Weſt Retford, Nottinghamſhire, 100000 Plants, THE GOLD MEDAL.

OCCIDENTAL PLANE TREE. To Thomas White, Eſq; Weſt Retford, Nottinghamſhire, 2 Acres & 2 Roods, THE GOLD MEDAL.

SPRUCE FIR. To William Melliſh, Eſq; Blythe, Nottinghamſhire, 101600 Plants, THE GOLD MEDAL.

DITTO.

1778 DITTO. To Thomas White, Eſq; Weſt Retford, Nottinghamſhire, 15000 Plants, THE GOLD MEDAL

SILVER FIR. To Thomas White, Eſq; Weſt Retford, Nottinghamſhire, 3000 Plants, THE GOLD MEDAL.

ELM. To R. Muilman Trench Chiſwell, Eſq; Debden Hall, Eſſex, 8634 Plants, THE GOLD MEDAL.

LARCH. To Joſeph Cowliſhaw, Eſq; 25600 Plants, THE GOLD MEDAL.

1779 ACORNS. To the Rt. Hon. Lord Paget, 24 Acres, THE GOLD MEDAL.

OAKS PLANTED. To the Right Hon. Earl of Donegal, 60420 Oaks, THE SILVER MEDAL.

SCOTCH FIR. To Francis Moore, Eſq; Aſpley Guiſe, Bedfordſhire, 51376 Plants, THE GOLD MEDAL.

NORFOLK WILLOW. To Thomas White, Eſq; Weſt Retford, Nottinghamſhire, 7000 Plants, THE GOLD MEDAL.

ASH. To Thomas White, Eſq; Weſt Retford, Nottinghamſhire, 35 Acres, THE GOLD MEDAL.

ASH. Mr. David Day, Frindſbury, Kent, 16 Acres, TWENTY POUNDS.

1780 ASH. To Edward Loveden Loveden, Eſq; Buſcot, near Farringdon, Berkſhire, 63000 Plants on 7 Acres 9 Perch, THE GOLD MEDAL.

LARCH. To William Melliſh, Eſq; Blythe, Nottinghamſhire, 47500 Plants, THE GOLD MEDAL.

CHESNUTS. To Mr. Joſeph Mace, of Aſhford, planted at Biddenden in Kent, 6 Acres, THE GOLD MEDAL.

1781 ASH. To Mr. David Day, Frindſbury, Kent, 150800 Plants on 3¾ Acres 1 Rood, THE GOLD MEDAL.

Various

Various Improvements in Huſbandry.

1777 RHUBARB. To Meſſrs. Callendar, New Caſtle upon Tyne, for cultivating and curing, 10½lb. THE SILVER MEDAL.

1775 MADDER. To Mr. John Crow, Feverſham, for cultivating and curing 18cwt. 2qrs. 18lb, from one Acre, TEN POUNDS.

1781 CUCUMBERS and MELONS. To Mr. Wm. Geach, for his method of preſerving, Two GUINEAS.

1777 ROMAN OX YOKE. To Mr. J. Black, Morden, Surry, for introducing the uſe of, THE GOLD MEDAL.

1779 CLUSTERED POTATOE. To Arthur Young, Eſq; Bradfield Hall, Suffolk, for an account of the culture, produce and application of, THE GOLD MEDAL.

1778 SCOTCH CABBAGE. To William Ilbert, Eſq; Bowringſleigh, Devonſhire, for planting, THE GOLD MEDAL.

1780 LUCERN. To John Pratt, Eſq; Poorfleet, Eſſex, for cultivating, THE GOLD MEDAL.

1775 DRILL PLOUGH. To Mr James Blancher, Attleborough, Norfolk, THIRTY POUNDS.

TURNEPS AMONG BEANS. To Mr William Tadman, Higham, Kent, for cultivating, &c. THE GOLD MEDAL.

1775 RUST IN WHEAT. To Mr Richard Winſor, Totneſs, in Devon, for an account of preventing, THE SILVER MEDAL.

1777 LAND LYING WASTE. To Mr. William Dinſdale, Hawkeſwell, near Bedale, Yorkſhire, for an account of improving, THE GOLD MEDAL.

1778 MACHINE FOR SLICING TURNEPS. To Mr Matthew Kite, SEVEN GUINEAS.

1777 TURNEP-ROOTED CABBAGE. To Mr Lewen Tugwell, Beverſtone, Gloceſterſhire, for cultivating, TWENTY POUNDS.

1779 DITTO, Ditto, FIFTEEN POUNDS.

DITTO. To Mr Robins, near Tetbury, Gloceſterſhire, FIFTEEN POUNDS.

PAPERS

PAPERS IN AGRICULTURE.

The Society received the following Informations from the Reverend Joſeph Carr, of Lancheſter, Durham, and William Melliſh, Eſq; of Blythe, Nottinghamſhire, reſpecting the Plantations made by Thomas White, Eſq;

THE whole of the Plantation, except the Larch, Spruce Fir, and Lombardy Poplar, was made in the Spring 1777; and is fenced with a ſtrong wall, ſix or ſeven feet high; notwithſtanding ſome of the Plants died, as muſt happen in ſo large an undertaking, yet as they were immediately reinſtated, the whole is in a very thriving condition, and refutes the Opinion of ſome perſons who thought ſuch young plants would not live through the Winter, being void of ſhelter, but very few were killed, even by the ſevere weather in the ſucceeding Winter.

In the proſecution of this ſpirited undertaking, which has gained Mr. White great credit and applauſe, he has already fenced,

fenced, for planting two hundred and twenty-ſeven Acres, and purpoſes to employ a thouſand in that manner; this when compleated will be of the greateſt ſervice to the Country, as it will hereafter be a means of furniſhing the Colleries about Newcaſtle with Timber at a cheaper rate than they can obtain it from Scotland, from whence it is brought to them at preſent.

Adjoining the wall which ſurrounds the Plantation, two houſes are built, in which people dwell who take care of it; and within the Plantation, is a nurſery, wherein a great number of Hazels, Sycamores, Beeches, Birches, &c. &c. were raised laſt Year, ſome of which are planted out, and thrive well.

This noble attempt has excited the curioſity of all the neighbouring Gentlemen, who beſtow on Mr White, great praiſe for his Reſolution; and the ſucceſs which attends it, is likely to produce rivals, at ſome future period.

The

The following is the Account received from Mr Joſeph Mace, to whom the Gold Medal, being the Premium offered for Planting Cheſnuts, was adjudged in 1780.

THE ſix Acres ſeventeen Perches I have planted with Cheſnut Plants, are in the midſt of thirty-two Acres of woodland, the greater part of which is not worth five ſhillings per Acre, per annum; the grubbing it coſt fourſcore pounds; not half the money was made of the Roots: the ſoil light, underneath a hard white ſolid ſand, of which they make Turnpike roads in the Weald of Kent. The oaks moſtly die on the top, and leave off growing before they are worth five ſhillings per Tree, owing moſt likely to the ſand being too dry for their roots to thrive in. There is a Park near Cranbrook, not more than four miles from my wood, with many large cheſnut Timber trees in it, and I am informed that the Timber in moſt of the old houſes

houſes in Biddenden, is Cheſnut: there are many hundred Acres of poor woodland near mine, in which the Oaks are of little value, moſt of them dying on the top before they grow to any ſize. If my Plantation ſhould proſper, (which is contrary to the opinion of people who live near it, who think I am burying Money in a poor ſand) there will be great room for improvement by planting the almoſt barren woods with Cheſnuts, I have ſent down upwards of three thouſand fine ſtrong two year old Cheſnut plants, which are now planting, and hope by this means to improve ſome Acres that were felled laſt Winter.

Mr. More.

I am Sir,

Your humble ſervant,

JOSEPH MACE.

Aſhford,

Aſhford, May 4, 1780.

To the Society for the Encouragement of Arts, Manufactures, and Commerce.

Gentlemen,

I intend leaving many of the beſt plants for Timber, in my ground at Biddenden, planted with Cheſnuts, finding that the Nuts are of value, as well as the Timber; I was informed that one plantation of Cheſnut-trees, near Maidſtone, produced 100 ſacks of Nuts, which were ſold at firſt for eight ſhillings per ſack, but there being few Spaniſh Nuts that year, they ſold higher afterwards; and I gave a guinea for two buſhels of them to plant: I have this year planted three quarters of a piece of land with Cheſnut plants, ſix feet a part, the other quarter, I have ſet with Nuts for Timber. As the Oak and Cheſnut thrive beſt without removing, they will ſtand at the

the diſtance of twelve feet ſquare, which I think is rather too near: it is my intention to thin them, and leave many of the beſt plants diſcretionally for Timber.

I am, Gentlemen,

With all due reſpect,

Your very humble ſervant,

JOSEPH MACE.

Thanks

Thanks were returned to the Earl of Moray and Mr. White, for the following Communication reſpecting the planting Trees for Timber in Scotland.

Extract of a Letter from the Earl of Moray, to Thomas White, of Weſt Retford, Eſq;

SIR,

The works here are going briſkly on, they will, I hope, meet with your approbation; I ſend you encloſed, a note of the Trees planted by my Gardener in the north country, which he has atteſted, and am,

Sir,

Your obedient humble ſervant,

Donibriſtle, June 6, 1781.

MORAY.

Memorandum of the number of Trees planted at Darnway, in the county of Elgine, ſince November, 1767.

Oaks - - - - - - - - -	211,000
Scotch Firs - - - - - - -	7,276,000
Aſh, Beach, Elm, Sycamore, Spaniſh Cheſnuts, Spruce-fir, and Larix - - -	159,000
Total	7,646,000

I William Linſay, Gardener to the Earl of Moray at Darnway, hereby declare that the above number of Trees were planted at my ſight and direction, and all well encloſed and taken care of, and are in the moſt thriving condition, ſigned by me at Darnway, this 26th day of May, 1780.

WILLIAM LINDSAY.

P. S. Since

P. S. Since the above atteſtation was ſigned, there has during the laſt Autumn and this Spring been planted

Firs - - - - - - - - -	600,000
Oak - - - - - - - - -	25,000
Beach and Aſh - - - - -	8,000
Elm - - - - - - - - -	4,000
Larix - - - - - - - -	4,000
	641,000
	7,647,000
Total	8,288,000

The Thanks of the Society were given to Owen Saluſbury Brereton Eſq. V. P. for communicating the following Letter from Mr. F. Samuel Kuckalm, to the Honourable Daines Barrington.

Kingſton, Jamaica, October 12, 1781.

Honoured Sir,

I know it gives you pleaſure to hear that any new improvements are made for the good of mankind; when I mentioned to you my flattering hopes of having the firſt orchard of European Fruit Trees within the tropics, the matter was doubtful; you feared they would not ſucceed; I have now the happineſs of acquainting you, I have Peaches in high perfection, both in taſte and ſize. I have had them weighing $6\frac{3}{4}$ ounces, and the Trees were as full of Fruit as any in Europe; alſo Apples equally fine in taſte, colour and ſize. By the different ſtorms in October, 1780, and that of Auguſt, and the 5th of September 1781, I have ſuffered greatly; I loſt

loſt ſeveral hundred grafted bearing Apple Trees, but having ſtill ſome thouſands of Trees left, notwithſtanding the dreadful weather and great ſcarcity in general, I have had, by the Lord's bleſſing, every thing in abundance, proviſions, vegetables, and above two thouſand buſhels of Iriſh Potatoes. I take the liberty to ſay, I have brought Vegetables of all kinds, to as high perfection here, as they are in Europe. If my life is ſpared a few years longer, I hope to bring Fruit to the ſame perfection; I ſhall have the pleaſure of ſending you Cyder made of the beſt of Apples in Jamaica. Captain King has ſeen my plantation, and is very capable of informing you what he has ſeen, he has been at different parts of this Iſland, and alſo in the windward Iſlands, which makes him a more able judge.

F. SAMUEL KUCKALM.

N. B. The Plantation is half-way up the Mountains.

The Gold Medal was adjudged to the Reverend Henry Lowther, of Aikton, in the Year 1765, for the following Communications relative to the comparative Culture of Wheat.

Aikton, November 29, 1765.

SIR,

According to your advertiſement of 10th April laſt, I ſend up the incloſed accounts of the moſt profitable and proper method of CultivatingWheat, in anſwer to the 65th, and 78th, articles, and alſo of the moſt profitable method of cultivating Barley, according to the 88th, and Turneps according to the 74th, article.

If you at any time think proper to write to me, pleaſe to direct to me, Rector of Aikton, near Carliſle.

I am, Sir,

Your moſt humble ſervant,

Dr. Templeman.

HENRY LOWTHER.

I have had the drill huſbandry practiſed by ſervants, under my direction, for upwards of twenty years, and have made many experiments: And as I do not doubt, but that a calculation of the different expenſe, and profit of parcels of ground, ſometimes contiguous, ſometimes near each other, ſometimes in different years the ſame, treated by ſowing in drills and horſe-hoeing the intervals, and by ſowing in broad-caſt, will be deciſive to aſcertain the propriety and profit of one of the methods in preference to the other. I ſhall now proceed to the calculations as ſupported by many experiments, and ſhall begin with an acre managed by each ſort of huſbandry, in the moſt profitable way, for three ſucceſſive crops.

Expence of managing one acre of ground for a Turnep crop, (which in the year before was ploughed out of ley, and had an Oat crop,) in the drilling way, for a Turnep crop.

	£.	s.	d.
Ploughing one acre in March with two horſes - -	0	3	6
Second ploughing in May -	0	3	6
Third ploughing in June -	0	3	6
Thirty ſmall carts (by one horſe) of manure at 4d. per cart	0	10	0
Forty-five buſhels (Wincheſter) of lime at 2d. per buſhel	0	7	6
Leading manure on (three days work) and lime one day's work, 1s. 10d. - -	0	7	4
Harrowing and drilling -	0	1	6
Three horſe-hoeings, each horſe-hoeing equal to one-third of an acre - -	0	3	6
Turnep ſeed - -	0	0	6
Spreading the manure and lime, one day's work -	0	0	10
£.	2	1	8
Crop of Turneps computed at	2	10	0

For

For a Barley Crop after the Turneps.	£.	s.	d.
Ploughing twice in March and April, or May - -	0	7	0
Harrowing and drilling -	0	1	6
Seed Barley, one buſhel Winchester - - -	0	2	0
Three horſe-hoeings -	0	3	6
	0	14	0
Crop of Barley computed at	1	16	0
For a Wheat Crop after the Barley Crop.			
One ploughing before Michaelmas - -	0	3	6
Harrowing and drilling	0	1	0
Seed Wheat at 4s. per buſhel	0	3	6
Five horſe-hoeings at 1s. 2d. per horſe-hoeing -	0	5	10
	0	13	10
Product or Crop of Wheat, fifteen buſhels -	3	0	0

Crop

	£.	s.	d.
Crop of Turneps firſt Year	2	16	0
Crop of Barley ſecond Year	1	16	0
Crop of Wheat third Year	3	0	0
	£7	6	0

Expenſes of Turnep Crop firſt Year - -	2	1	8
——Barley Crop ſecond Year	0	14	0
——Wheat third Year	0	13	10
	£3	9	6

Expenſe of managing one acre of Ground by ſowing in Broad Caſt after ploughing it out of Ley and ſowing it one Year with Oats.

For a Turnep Crop.

Three Ploughings as before	0	10	6
Double expenſe of manure, lime, and leading -	2	9	8

Spread-

	£.	s.	d.
Brought over	3	0	2
Spreading manure and lime, two day's work - -	0	1	8
Turnep Seed and ſowing	0	2	0
Harrowing thrice -	0	1	6
£	3	5	4
Crop of Turneps computed at	3	0	0

Expenſe of Fallowing in the Year after Turneps for a Wheat Crop, &c.

Four Ploughings - -	0	14	0
Four Harrowings and Sowings	0	2	6
Seed Wheat - -	0	12	0
£	1	8	6
Crop of Wheat computed at	4	16	0
Value of Crops for the three Years	7	16	0
Expenſes for the three Years	4	13	10

Expenſes

Expenſes of a Barley Crop in the Broad-caſt Way.	£.	s.	d.
Three Ploughings -	0	10	6
Manure, lime, and leading	2	9	8
Seed, three buſhels -	0	6	0
Harrowing thrice and ſowing	0	2	0
	£3	8	2
Crop nine buſhels	2	14	0
Loſs on this Crop -	0	14	2

From the accounts already ſtated, it appears evidently that the drilling method with the intervals horſe-hoed, is much more profitable than ſowing in broad-caſt Wheat, Turneps, and Barley.—The profit of one Acre drilled and horſe-hoed for three years, appears to be *3l.* 17*s.* 6*d.* to anſwer rents for that time, and leave the reſt clear—whereas the profit of one Acre ſown in broad caſt, and computed in the ſame way for the ſame years, will only amount to *3l.* 2*s.* 2*d.*

But

But the following additional obſervations will abundantly evince the great ſuperiority of the drill method.

Firſt, a Farmer with the ſame quantity of manure and lime, may ſow in drills, horſe-hoeing the intervals, a parcel of Ground juſt double to that which he can ſow in broad-caſt; Then the yearly quantity of Wheat growing on two Acres, drilled and horſe-hoed, will be to that ſown in broad-caſt on one Acre, as twelve to eight, and the profit (including the yearly rent of theſe two Acres, computed at eight ſhillings per Acre, will be to the profit of the broad caſt Acre, as, 4*l.* 12*s.* 4*d.* to 3*l.* 2*s.* 6*d.*

The yearly crop of Turneps growing on two Acres drilled, &c. will be to that growing on one broad-caſt Acre as ten to ſix: the yearly profit of the ſaid two Acres, including rent, as before, will be 16*s.* 8*d.* whereas in the broad-caſt way, there will that year be a loſs of 5*s.* 6*d.*

Secondly,

Secondly, In the broad-caſt way, there is a ſort of neceſſity for fallowing the year after the Turneps. If Barley were ſown that year and there were no Fallow, it would hurt the Wheat crop in the third year, and by conſequence the ground alſo.

Thirdly, The Grains of Wheat and Barley, will both be larger and fairer in the drilling, &c. than in the broad-caſt method.

Fourthly, It adds greatly to the ſuperiority of the drilling method, that the drilled Acre without any additional manure will produce two good crops more, viz, one of Barley, and the other of Wheat, whereas the broad-caſt Acre, after the Wheat crop, will without further help, produce no more to any advantage.

The ground in which theſe experiments were moſtly made, was a heavy moiſt ſoil ſeated on a clay bottom, of about the yearly value of 8ſ. per Acre, not very proper for

for Barley, or Turneps, being rather too ſtiff.

I uſe a drill plough of my own contrivance, as an improvement of Tull's, it hath only two little wheels, and drills at once three rows, at ſeven inches diſtance, and covers the ſeed without any harrowing, is eaſily managed, and a ſervant of common ſenſe, may learn the uſe of it, in a few hours practice: The ridges are formed of the breadth of five feet and a half; with the ſame drill plough, I ſow Turneps in one row by a contrivance, more ſimple, but as certain as that of Mr. Tull's. I thought to have ſent up my drill plough to the ſociety, according to their advertiſement, but was deterred by the inconveniences. I have the ground horſe-hoed very well, by a common plough, with the contrivance of a bridle with notches, extending eight or nine inches to the right, from the end of the beam, by which the two horſes draw.

A dry

A dry and loamy ſoil, not naturally poor, friable, and neither ſtiff nor light, of a competent depth; nine or ten inches, promiſes beſt ſucceſs for Wheat, both in the drill and broad-caſt way. It will anſwer in the broad-caſt way, if it is ſomewhat ſtiffer.

In the Years 1775, *and* 1776, *The Thanks of the Society were ordered to the Reverend Mr. Lowther, of Aikton, near Carliſle, for the following Communications.*

Aikton, Auguſt 4, 1774.

SIR,

I am a great lover of Agriculture, and have practiſed Tull's method above thirty years; in the year 1765, the excellent Society for improvement of Arts, &c. was pleaſed to honour me with a gold medal for my account of cultivating Wheat, in which I endeavoured to demonſtrate the ſuperiority of the new Huſbandry, by ſtated accounts of the profits and diſburſements of the two different methods.

After this introduction, I ſhall beg leave to obſerve to you, that I have lately invented a Drill Plough, for the carrying into execution one of the moſt valuable diſcoveries which appears to have been made

in the whole new ſyſtem; I mean that which John Mills Eſq; in his new ſyſtem of practical huſbandry, vol. 2. page 256 to 259, from experiments of M. Chateauvieux, takes occaſion to mention. This ingenious Gentleman was reſolved to try ſowing Wheat in cluſters,—he for this purpoſe prepared a bed 40 feet long, and five feet broad. In this he ſowed 3 rows about 7 inches diſtant from each other, he alſo ſowed grains of Barley in cluſters, each cluſter at 6 inches diſtant from each other, putting one grain in the firſt, two in the ſecond, and ſo on to the ſixth, which had ſix grains, and then began again, and went on till the whole row was ſown, only the ſouth row had no cluſters in it leſs than of 3, 4, 5, or 6.

The reſults were, the ſouth row ſown with

6 5 4 3 Grains

produced

666 624 447 493 Stalks

The

The middle row ſown with

1	2	3	4	5	6	Grains
produced						
48	72	147	204	219	487	Stalks

The north row ſown with

6	5	4	3	2	1	Grains
produced						
502	372	345	276	200	92	Stalks

The whole number of Stalks were 5189, which yielded ſeventeen pounds of Grain, and an Acre ſown in this manner is computed to produce according to this calculation, near nine Quarters.

On the 23d of September enſuing, he ſowed the ſame bed with Wheat, in doing of which, without ploughing it up, he only plucked up the ſtubble, and made three channels, into which the ſeed was dropped by hand, in clusters, ſix inches aſunder, and all theſe cluſters were at leaſt ſix, ſome ſeven, and others eight grains, the produce was twenty-eight pounds; on

which footing the whole Acre, if ſown in this manner, would produce near thirteen Quarters.

The year after, September the 16th, 1755, he ploughed up this bed, and ſowed it in three rows of ninety-three cluſters in each row, and ten or fifteen grains in each cluſter, in this caſe he uſed a ſmall iron hoop of three inches diameter laid upon the ground at every ſpot intended to be ſown, the ſeed had the liberty of this circumference, and the ſpace from one center to the other was five inches, the product of theſe rows were twenty-three pounds, which will make about ten Quarters for the whole Acre.

Now the crops produced by theſe three ſeveral experiments, appeared to me ſo amazingly great, that I immediately caſt about for the contrivance of ſome machine for the ſowing in cluſters at ſix inches diſtance, without the tedious work of dropping by hand, which was the only way that the ingenious

ingenious Mr. Chateauvieux, ſo famous for the contrivance and machinery of his Drill Plough, appears to have made uſe of.

After ſeveral attempts, in which I was at firſt baffled by the difficulty of contriving the inſtantaneous motion of the ſeed with the progreſſive motion of the Plough; I at length hit upon a method which anſwers beyond my expectation.—The Drill Plough which I have conſtructed for this purpoſe, is eaſily wrought without a horſe, by the labour of a ſingle man, the Grains of Wheat are diſcharged at the diſtance of 6 inches from the center of every cluſter in channels, which it makes for them, and afterwards covers with mould; and the Grains in the cluſters (by the motion of a ſmall braſs plate) may be ſown in any number from four or five, to thirteen or fourteen.

If the Society have a deſire that I ſhould ſend a full deſcription of this Drill Plough,

and the conſtruction of it, you will pleaſe to ſignify their pleaſure to me and it ſhall be obſerved*. It hath not long been finiſhed, but from the few obſervations I can yet make, I have reaſon to prefer this form of Drilling to all others; and I have for theſe laſt ten years, uſed a Drill Plough of my own conſtruction, which is wrought without a horſe, and in the regular ſowing and covering of the rows in the common form, and in the product ariſing from them, cannot be exceeded by any other but this.

I am,

Your moſt humble ſervant,

HENRY LOWTHER.

* The Death of the Reverend Author of this Paper has prevented the Society receiving these Machines.

Mr. MORE.

Aikton,

Aikton, March 15, 1775.

SIR,

In the latter end of September laſt, I ſowed ſeveral ridges 5 feet wide with my new Drill in Cluſters, containing different numbers of grains of Wheat from 3 to about 16; they roſe and proſpered very well, to ſuch a degree that affording a full bite, they attracted the Hares in preference to Wheat ſown in the common way, and were in a few days devoured to the ground; however after this they recovered beyond my expectation, and in the latter end of February, and beginning of March, tillered in a manner ſuperior to any I remember of my formerly drilled Wheat, the reſult of this favorable appearance I muſt wait for till harveſt, when I propoſe to do myſelf the honor to ſend an accurate account to the Society, together with a deſcription of the Machine if deſired.

I am, Sir,

Yours, &c.

Mr. MORE. HENRY LOWTHER.

Aikton, near Carliſle, Octr. 20, 1775.

SIR,

In the courſe of this year's experiments, I have reaſon to conclude the method of drilling in cluſters, preferable to the common method, which I beg leave to communicate to the Society. Drilling in cluſters, I look upon to be a valuable diſcovery, and to aſcertain the manner of doing it to the beſt advantage, I drilled for this preſent year's crop, two rows, one containing cluſters of three or four grains of Wheat, and the other ſeven or eight, which had double the increaſe to that of the leſſer number. And I obſerved that cluſters of a greater number of grains, to fourteen or fifteen, had generally ſtill a greater increaſe. Where a row of ſeven or eight in a cluſter grew, I cut a ſingle yard of it, conſiſting of ſix cluſters, containing on an average, twenty ears each, and thoſe twenty ears weighing one

one ounce, ſo that the whole row weighed ſix ounces for that yard. And if the other correſpondent row had been drilled with equally large cluſters, it would have produced another ſix ounces; and ſo the two rows in one yard, would have produced twelve ounces, which, according to the number of ridges and rows, which I have laid out in an acre, will amount to above thirty-ſix Wincheſter buſhels per acre. I only have two rows drilled on a ridge, (tho' formerly I uſed to have three, and ſometimes four,) the rows ſix inches aſunder, and the ridges, four feet and an half wide.

Although I have ſtated above, the produce of a cluſter at only twenty ears, yet there were ſeveral which exceeded that number to thirty, and even forty and upwards. In ſhort, Sir, I think I have abundant reaſon to give the preference to the drilling in cluſters, and the Machine performs to a wiſh.

I have

I have this ſeaſon a great many ridges, or rather beds, of about a foot broad, dreſſed for the Machine to turn upon, covered with beautiful tufts at regular diſtances.

I am, Sir,

Your moſt obedient

humble ſervant,

Mr. MORE.

HENRY LOWTHER.

The

The Thanks of the Society were ordered to Mr. Gaunt and to the Rev. Mr. Broke for the following Communications.

November 9, 1778.

SIR,

A Root of ſet Wheat was ſent to the Society for the Encouragement of Arts, &c. ſometime in Auguſt laſt, by Mr. Gordon, of Fenchurch Street; and I am informed you wiſh to know the particulars relative to it. I had it taken out of a field belonging to the Rev. Mr. Broke of Hintleſham, near Ipſwich, Suffolk: That gentleman has tried the experiment for ſome years, and has always had very great crops. It does not take quite two pecks to an acre to ſet; but if ſown, eight pecks are ſcarcely ſufficient; ſo that there are ſaved by this method, at leaſt ſix pecks per acre: And

And the farmer has an opportunity of keeping it free from any kind of weeds, as the grains are ſet four inches aſunder. For any further particulars, if you would be pleaſed to refer to the abovenamed gentleman, I know he would be glad to render any ſervice towards the improvement of Agriculture.

I am Sir,

Mr. MORE.

Your very humble ſervant,

JOHN GAUNT.

October

October 17, 1777, I began to ſet Kentiſh white Wheat, on a Clover Lay of five acres, and finiſhed it on the 22d, with two dibbers and ſeven droppers; it was ſet upon the top of the flag, the holes between five and ſix inches aſunder, that in caſe of much rain, it is not ſo liable to be hurt as if ſet in the furrow. The holes about three inches deep, and only one grain to be dropped into a hole. The ſet Wheat has the advantage over the ſown in the following particulars, viz. As being deeper in the ground, it is not ſo apt to be root fallen; and the ſtems being much ſtouter, it is not ſo ſoon laid. Nor is it attended with more than half the expenſe to keep it clean. The farmers ſow from eight to ten pecks an acre; I only ſet two. The ſetting coſts 10s. an acre, but the ſaving in the ſeed when the Wheat is cheap nearly, but when dear, more than pays for it. The crop by good judges, was laid at near five quarters an acre, which conſidering the quality of the land, would have been

been a very great one, but it was greatly damaged by a mildew, which was the general fate of the Wheats in this neighbourhood. As I have only thraſhed a part of it, cannot aſcertain the quantity, but I fear it has reduced it near one half.

JOHN BROKE.

Hintleſham,
Nov. 16, 1778.

The produce of eight roots of Wheat from eight grains, ſuppoſing twenty grains to an ear, but I am very ſure forty is nearer.

Stems	Grains.
26	520
29	580
30	600
34	680
34	680
38	760
39	780
46	920
276	5520

Thanks

Thanks were ordered to the Perſon ſigning Aaron Arable, for the following Communication concerning the Advantage of Urine and the Liquor of Dunghills, uſed as Manure.

To the Society for the Encouragement of Arts, &c.

Boſton, Lincolnſhire, Nov. 18, 1775.

Gentlemen,

ENcouraged by a letter bearing date the 14th inſtant, I take this early opportunity to ſend the following obſervations on the Science of Agriculture for your inſpection; but of what utility they may be to the Public, I muſt leave to your ſuperior judgment.

Firſt, There is not any perſon who has lands in poſſeſſion, but knows in ſome meaſure

meaſure the value of Manure; yet none of them conſider they ſuffer a great part of it to be loſt, viz. the Urine, or liquid Salts, that run from dunghills, and from the places where cattle are kept. Thoſe liquid Salts, though unregarded, are the very beſt part of the Manure, and that wherein the goodneſs of it conſiſts. To add force to this argument, let a Chemiſt take a ſmall quantity of Manure and extract out all the Salts, the ſubſtance that will be left, will have loſt all its uſeful qualities, and be like ſo much dead ſand or ſoil that never had ſuch properties.

If what I have ſaid be true, what a groſs error muſt it be to let ſuch large quantities of this valuable article be loſt! To prevent which, I would adviſe all farmers, &c. that keep cattle, to provide themſelves with a Ciſtern to receive theſe liquid Salts, and to diſpoſe of them in the following manner:

Let

Let the ſtrongeſt that can be got, be kept to ſteep Seeds of in all kinds before they are ſown, and the remainder to be laid upon the land by a barrel cart, or what is commonly called a water cart, with a trough fixed to the tail of the cart, with holes in the bottom, the conſtruction of which needs no deſcription.

The profit which will ariſe from this experiment appears to me to be very conſiderable, and may be partly proved by what is already practiſed by the Farmers, viz. The folding of ſheep upon their tillage, which ſeldom fails to produce plenty of Corn, and it is agreed by all reaſonable men that the Urine in great part is the cauſe of it.

Secondly, I ſhall obſerve how the Farmer ought to diſpoſe of this Manure. As moſt Farmers have as much Paſture as Arable, it is my opinion that the Manure ſhould all be laid upon the Paſture (liquid

Salts excepted) by this means there would be good paſturage for Stock, and that land, when it is ploughed up, will always produce a plentiful Crop. Now as this would appear contrary to the notions of Farmers in general, I ſhall endeavour to prove what I have ſaid, by the following argument. When a Perſon lays Manure upon Paſture, it is with an intent to improve every vegetable then growing, and to raiſe more if poſſible, which, if the Manure be good, never fails to produce the deſired effect. But to lay Manure upon Tillage that is full of weeds, is to encourage what ſhould be deſtroyed. This, though practiſed by the Farmers, to me ſeems wholly wrong; and to make it ſtill worſe, the freſh Manure they lay upon the land, is full of the ſeeds of weeds of every denomination, (the refuſe of the barn) and then they wonder how the weeds grow, notwithſtanding they ſet and ſow them themſelves. Now as I ſuppoſe it is, or ought

ought to be, freſh Land that is in Tillage, the Salts that may be incorporated into the ſeed, by ſteeping, will cauſe as much fertility in the Grain, as when Manure is laid on in a profuſe manner, while the weeds with frequent ploughing in dry ſeaſons, will be deſtroyed.

The third and next Obſervation I ſhall make, is with a deſign of improving what is already done, and this will in part prove what I have ſaid with reſpect to liquid Salts. Moſt Farmers who cultivate clay land, (know by experience) that if they do not ſteep their Seed Wheat in ſalt water, brine, or ſome other liquor that is ſalt, and afterwards lime it, the Crop will be very indifferent; and ſo it commonly proves, unleſs upon very rich land. The Farmer that prepares his ſeed as aforeſaid, is right ſo far; all that is wanting, is, he never does enough at it, for though the Salts may be ſo ſtrong as to

help Vegetation, yet the lime is not ſufficient to preſerve it from inſects and from periſhing.

Now to improve on this, let the Seed be ſteeped in the ſtrongeſt ſolution of Salts that can be got, then take a ſufficient quantity of lime and mix with the Seed while wet, which when dry, wet it again and mix more lime with it, and let this be done in proportion to the quality of the land. The proof of this experiment will appear in the following Obſervation. If it be known that a ſmall quantity of Salts and lime does ſome good, a larger quantity would do more; for it may be obſerved, that thoſe Countries where Lime-ſtone is found, always produce the beſt crops of corn, which proceeds from the warmth of the Lime-ſtone and the mineral Salts that are contained in it.

Fourthly,

Fourthly, It has been obſerved that ſome Farmers have gone ſo far as to prepare their Seed Wheat, yet none of them conſider that Beans, Barley, &c. require the like encouragement. For tho' there is no danger of Spring Corn periſhing, yet the Salts that may be incorporated into the Seed, would help Vegetation in this ſort of Grain as well as in Wheat; and if a little lime was uſed it would do good, eſpecially upon cold Clay Land. As I have reaſon to believe that ſteeping Spring Corn in Salts, would make it more fruitful, ſo I am perſuaded that it would cauſe an earlier harveſt; for as Corn that is ſown dry, and in a dry ſeaſon, will lie a long time before it appears, ſo the Corn that is ſown wet will appear ſooner above the Ground, and thus have the advantage.

Fifthly, To conclude, I will ſuppoſe (which perhaps is not the caſe) that every thing which I have ſaid is conſonant to

reaſon, yet, notwithſtanding the reaſonableneſs of it, it is impoſſible for me or any other private perſon, to convince the Farmers that they are wrong; nor are hopes of a reformation in this ſcience well grounded, unleſs You or ſome other Body of Gentlemen, who are Well-wiſhers to their Country, take it into their conſideration and protection.

I am, Gentlemen,

Your very humble Servant,

AARON ARABLE.

The

The Gold Medal, being the Premium offered for improving Land lying Waſte, was adjudged in the Year 1775, *to Mr. William Dinſdale of Hawkſwell, near Bedale, Yorkſhire, from whom the following Accounts were received.*

1764, Began to incloſe about two hundred Acres of barren Turf Land, which at that time produced only Ling.

1765, Ploughed and ſowed part with Oats, which was thought moſt proper for that purpoſe. Produce of no value. Ploughed them down for Winter Fallow.

1766, Ploughed the Land again, and limed it with about eight quarters per acre. Sowed Peas, Oats, and Lentils. None good for any thing; they were therefore all ploughed in as above. Alſo ſowed Bigg, a kind of Scots' Barley; Straw plenty, with ears and awns, but no Corn, though Pigeon's dung and ſalt were ſown upon it.

1767, Burnt the Ling very cloſe in the Spring, then ploughed in the Autumn, harrowed and ploughed acroſs, let it lye all Winter in this rough way. About the beginning of March, harrowed very well, ſo ſoon as dry, ſet to work, burnt all the Clotts, Sodds, &c. both upon this and what was done as above; and limed among the Aſhes, about eight Quarters per Acre. Sowed Turneps about the 20th of June. Tolerable good. This method was allowed to ſucceed from the mixture of Aſhes; ſo the next Spring, ſet to paring and burning in the common way upon a freſh part. When burnt, ſpread the Aſhes, and mixed them with Lime, the ſame quantity per acre, as before; then ploughed and ſowed this piece with Turneps, the beginning of June, alſo that which had been Turneps the Summer before, both ſown after once ploughing, and both a tolerable Crop; but that which was Turneps the year before was much the beſt; though the paring coſt eighteen

ſhillings

ſhillings per acre, as all the Turneps were eat upon the ground with ſheep. The firſt part was perfectly fine, ſo was ſown with graſs ſeeds, a mixture of Mr. Rocque's Burnet, and Dwarf Poa, white Clover, Rib-graſs, Fitch-graſs, Cow-graſs, and ſome common Hay ſeeds and Rye-graſs. It proved a good Crop. No Burnet the ſecond year, nor Rye-graſs. The fourth year, Dwarf Poa. Never good for any thing. It all grows, but its produce worth nothing. Fitch-graſs worth nothing after the firſt year. The graſs ſeeds were ſown after once ploughing, after the Turneps were eaten upon the ground by ſheep, as before ſaid, but harrowed very fine, then ſown, and harrowed once over afterwards with light Harrows, and rolled with a pretty heavy wooden Roller. From what had been done it was very clear; the art was how to get Aſhes at the cheapeſt rate, ſo reſolved to burn the Ling when dry, where it grew; then plough, harrow, and plough acroſs,

acroſs, and let it lye one Winter, as was done before. This method proved ſucceſsful. After harrowing and burning in the Spring all the Clotts, Sodds, Ling, &c. and mixing thoſe Aſhes with about eight quarters per acre of Lime, ploughed both in together, and ſowed Turneps the beginning of June. This also proved a tolerable Crop, but the ſecond Crop always beſt, ſown after once ploughing, and without any more Dung or Lime of any ſort.

After many experiments, reſolved to burn the Ling early in the Spring, to plough any time in the Summer, the ſooner the better; harrow well about Michaelmas, then plough acroſs; let it lye in that rough manner all the Winter; harrow well in the Spring, and burn all the Clotts, Sodds, Ling, Stalks, &c. ſpread thoſe Aſhes, harrow again, burn again all that can be gathered, then ſpread thoſe Aſhes, and have eight, ten, or twelve quar-

quarters of Lime ready to put upon each Acre, and plough all in together; then ſow about a pound of Turnep ſeed per Acre, and ſow in May, if it can be got ready, turnep two years, and eat them with Sheep. Sow Graſs-ſeeds after the ſecond Crop, and you will be ſure to have a fine paſture, and all expenſes paid by the Michaelmas Eatage of your Graſs, and the Turneps as before deſcribed.

After ſowing all ſorts of Graſs-ſeeds, which could be got by any means, I mean Perennials, it is clear beyond a doubt, and plain to every perſon who views the improvements, that the following ſorts anſwer the beſt.

To every Acre	£.	s.	d.
Two buſhells of common Hay ſeeds	0	1	4
Two buſhells vernal Graſs ſeeds	0	3	0
Ten pounds of Rib-Graſs ſeeds - -	0	2	11

Brought

	s.	d.
Brought over	0 7	3
Four pounds of white Clover -	0 2	4
	0 9	7

Mix the Vernals and Hay ſeeds together, and ſow them by themſelves; and mix the Rib graſs and white Clover together, and ſow them by themſelves. By this method they ſow the beſt. After once ploughing and good harrowing, ſow your Seeds, harrow them in with a Buſh Harrow, and roll well, that is, once over very truly, ſo as no part is miſſed, with a good Roller.

By the above method, about one hundred Acres are converted into very fine Paſtures, the reſt into Plantations and a fine Pond; only about forty Acres into Tillage, which lay lower than the reſt. This is managed by firſt, Turneps, then Oats,

Oats, then a Fallow, then Wheat, upon which is ſown, red Clover and Rye graſs, of which it brings very good Crops, this laſt dry Summer particularly good.

Since this incloſure has made its appearance, by letting the Neighbours ſee what might be done, near two thouſand Acres have been incloſed, a—real fact.

If the worthy Gentlemen for the Encouragement of Arts, Manufactures, &c. ſhould take notice of this Paper, and ſhould require proof of what is inſerted, or any information more than is already given, their requeſt will be readily complied with by directing a line for

Their obedient humble ſervant,

OPERATOR.

At the Poſt Houſe, Bedale, Yorkſhire.

Dec. 23, 1775.

To Mr. MORE. SIR

SIR,

As the Society has been pleaſed to poſtpone the conſideration of my ſyſtem for the improving very bad waſte Turf-moors, till after the ſecond Tuesday in December next, hope they will permit me to add a few more lines with my Credit incloſed.

I know it is impoſſible for any perſon to lay down the expenſe of incloſing Commons, breaking them up, &c. who has not ſeen the ground, therefore will not attempt doing it, but I have known fence walls made from ſix ſhillings to eight ſhillings and ſixpence per Rood; and a double Cam made this year 1776, over wet Land not fit to bear a wall, planted on both ſides with Willows, (Trellis like) with a third row in the middle, all grows well, and is very likely to be a very good fence, as they ſtand ſo high that nothing can croſs them, make a fine ſhelter, &c. at three ſhillings per Rood.

This

This is allowed to be very good work, as the Ditches will make main Drains.

And I am very certain the greateſt part of waſte Turf Moors, are to be made into very fine Paſtures, if not fit to be continued in Tillage, as I have ſaid in my firſt Account, and proved beyond a doubt to the ſatisfaction of all that have ſeen my improvements, nearly at the following expenſe; few will require more, and a great many leſs.

And was the ground turneped three years, and eaten with ſheep, &c. as directed, I dare ſay the profit would be greater, and the ground better; but this I never experienced.

First Crop.

	£.	s.	d.
Burn the Ling in March, for doing it, 2d. per acre -	0	0	2
Plough as ſoon after as convenient, per acre - -	0	8	0
Harrow well ſoon after, ditto	0	1	6
Croſs plough in the Autumn, ditto - - -	0	5	0
Harrow well the beginning of March, ditto - -	0	2	0
As ſoon as the clotts, &c. are dry, burn well, ditto -	0	5	0
Let the Ground be harrowed again, ditto - - -	0	1	0
When the clotts, ſods, &c. are dry, burn well, ditto -	0	3	0
Lime and fetching ditto, two chaldron, ditto - -	1	4	0
Spreading ditto, - -	0	1	6

	£.	s.	d.
Brought over	2	11	2
Spreading the aſhes, per acre	0	1	0
Harrowing in ditto before it is ploughed, per acre -	0	1	4
Plough directly and ſow in May, if ready (Turneps) per acre - - -	0	4	0
Harrow well before you ſow, ditto - - -	0	1	6
Turnep ſeed, ditto -	0	0	6
Harrow once after ſowing, and ſowing, ditto - -	0	0	8
£	3	0	2
Turneps from two to three pounds per acre, average -	2	10	0
Loſs on firſt Crop - £	0	10	2

Second Crop.

	£.	s.	d.
Plough latter end of May, per acre - -	0	4	6
Harrowing before and after ſowing, ditto - -	0	2	0
Seed (viz. Turneps) -	0	0	6
In April, or latter end of March, if the ſeaſon be good, plough once for graſs ſeeds, per acre - -	0	4	6
Harrow well before you ſow, ditto - - -	0	2	0
Four pounds white clover ſeeds, per acre, the price 1776	0	2	6
Ten pounds rib graſs ſeeds, ditto	0	2	6
Two buſhels of vernals, ditto	0	3	0
Two buſhels common hay-ſeeds, among them, if well			

choſe,

	£.	s.	d.
Brought over	1	1	6
choſe, are great poa cow-graſs, &c. - - -	0	1	4
Bruſhing in and rolling, per acre - - -	0	0	6
Expenſe - - £	1	3	4
Second Crop of Turneps, average - -	2	10	0
Eatage of the paſture in the Autumn with ſheep or light beaſts, per acre - -	0	10	0
£	3	0	0
Expenſe £1 3 4			
Loſs on firſt Crop 0 10 2			
	1	13	6
Profit when in fine paſtures, per acre - - £	1	6	6

I have charged nothing for clearing the ſtones, as they are worth the expenſe.

When the Graſs is eaten off in the Autumn, clear the Ground from all kind of

Stock, that it may not be poached nor trod into holes, which will hold water, and quite ſpoil the Turf or new Swath.

Do not mow it, but paſture it every Summer for the firſt three or four years.

Prepare Compoſt by any ſoil taken out of drains or ditches, mix it with lime, about a Chalder per Acre; obſerve to put the parts which have the moſt Clay in the Mixture, upon the lighteſt Ground, and the lighteſt Mixtures upon the ſtrongeſt Ground; and put it on between Michaelmas and Martinmas; neareſt Michaelmas is the beſt. When put on, ſpread and bruſh it in directly, or it will kill the young Plants. Do it in a dry Seaſon, but paſture the Land one Summer before any is put on. This Compoſt is better than any Dung be it ever ſo rotten.

If the Ground be ſoft, never let any thing come upon it the firſt two or three Winters, and, if a wet Summer, keep off all kind of heavy Stock.

I am the Society's

obedient humble ſervant,

Mr. MORE.

OPERATOR.

Septr. 2, 1776.

Be ſure to eat both Crops of Turneps upon the ground, with ſheep, lambs, or what we call Hogs, which are young ſheep that have never been clipped, which always leaves the moſt profit. Let the ground be divided with nets, and a ſlack bar between them, each net twenty yards long. This is a cheap way of doing it,

as the nets will laſt, if well done, ten or twelve years, winter and ſummer; and I never had more than one ſheep hurt by them.

If the ſeaſon proves wet, and you cannot get forwards in due time, in June the lateſt; let it lye till the Spring following. This happened to about four acres in 1774, which were compleated in this manner, and the Turneps in 1775, worth four pounds per acre. I produced a few at Richmond fair, which was held (and is annually ſo) upon the 24th of September. They weighed upwards of ſixteen pounds each; and as near as could be calculated, had encreaſed one pound in weight every week, from the time of their being ſown. It was at an Ordinary in Richmond, where there were many capital Farmers preſent, amongſt the reſt, Mr. William Head, of Gayles, now greatly engaged in the improving Moor Lands,

Mr.

Mr. Liſton, ſteward to Sir Lawrence Dundas, &c. &c. The Ground was ſown with Graſs ſeeds as directed in April laſt, that is, 1776, and is this year worth fifteen ſhillings per Acre to Michaelmas, for feeding light Stock.

The Gold Medal was adjudged to William Ilbert, Eſq; of Bowringſleigh, for planting Scotch Cabbage, from whom the following Account was received.

Gentlemen,

IN Conſequence of the Premium offered by the Society of Arts, &c. in the year 1777, for the Culture of the Scotch Cabbage, I beg leave to ſubmit the following particulars to your conſideration.

On the 7th of June laſt, Richard Gaylard, my gardener, under my direction, finiſhed planting one acre of land, ſtatute meaſure, containing one hundred and ſixty perches, at ſixteen feet and a half to the perch, with green Scotch Cabbage, in rows four feet diſtant from each other, and the Cabbages in the rows, three feet diſtant. The ſeed was ſown the latter end of Auguſt, 1776. The ſoil was a reddiſh Loam, value about twenty ſhillings per an-

annum; a Bean ſtubble, twice ploughed; the firſt time in December, and afterwards in May; manured with an inconſiderable quantity of Dung; horſe-hoed three times with a plough of a very ſimple conſtruction, of my own invention. On the 20th of December laſt, I cut one Perch of Ground, (not in the beſt part of the acre) the produce of which weighed five hundred and one pounds, free from ſtumps, roots, dirt, and decayed leaves; ſo that the produce of the whole acre may be fairly computed at eighty thouſand one hundred and ſixty pounds.

Many ſingle Cabbages, cut from time to time, have weighed from thirty to thirty-five pounds each. Had I wanted them, and cut them before the large under leaves began to decay, the produce would have weighed conſiderably more. The culture of this Vegetable for Winter Fodder was, till within theſe five years, unknown in the ſouthern part of Devonſhire. I have now the

the ſatisfaction to ſay, that it is adopted by moſt of the more rational Farmers within my neighbourhood, who are convinced of its great utility.

If this ſhort account ſhould be thought worthy of your notice, I ſhould think myſelf highly honoured by any mark of your diſtinction.

I am, Gentlemen,

Your moſt obedient

humble ſervant,

To the Society for the Encouragement of Arts, &c.

WILLIAM ILBERT.

January 18, 1778.
Bowringſleigh, West Alvington,
near Kingsbridge, Devon.

The

The Thanks of the Society were given to Sir William Fordyce, for the following Communications reſpecting the Culture of Rhubarb.

Dear Sir,

BE ſo good as to lay the incloſed Paper before our honourable Society of Arts, Manufactures, and Commerce, as I flatter myſelf it may forward the cultivation of one of the moſt uſeful and valuable of our Drugs.

I remain, dear Sir,

truly yours,

Mr. MORE.

WILLIAM FORDYCE.

Warwick Street, Golden Square, Nov. 20, 1780.

Sir,

SIR,

About three weeks ago I took up three Roots of the true Rhubarb, ſix years old, weighing, when waſhed, ten pounds ſix ounces Averdupois. I ſtripped off the bark from the ſmaller roots, and cut off moſt of the bark from the larger parts of the roots, and hung them up, feſtoon faſhion, on packthread, at three or four inches diſtant from each other, to prevent their turning mouldy, before my parlour and kitchen fires, at a moderate diſtance, as directed in Sir Alexander Dick's memoir to the Society, for the culture and drying of Rhubarb, for which he obtained their Gold Medal. In this manner I find myſelf in poſſeſſion of one pound four ounces Averdupois, of roots, equally fit for the market as any imported from Ruſſia, Turkey, or China, as you will ſee by the Specimens I ſend herewith for the inſpection of the Society. I

have

have obtained likewiſe one pound more, fit for private uſe, or to be powdered.

I ſend at the ſame time two other ſpecimens, which I expected would produce the largeſt and fineſt pieces for the Market, but was diſappointed; for when I began to raſp off the bark, which I had rather inadvertently left on them, I found the part covered with the bark, moiſt and ſpoiled, though they appeared very promiſing, and would have deceived Judges. From which I infer, that it is abſolutely neceſſary to have the root cleared entirely of the rhind, to have it dried in perfection. I propoſe for the future, if I cure any large pieces, to make a perforation in the middle, in the way we receive many of the roots from abroad, from a belief that they will dry more perfectly, and require leſs attention, leſs fuel, and leſs time, and avoid thereby the inconvenience of having too many roots on my hand at a time, of ſo ſucculent a plant.

It is worthy of notice, that of ſeven or eight promiſing Plants, that I had under ſhelter for the ſake of preſerving the Seed, only one Plant ſhed Seed, that produced in a few days ſeedling Plants. The adverting to this little circumſtance, explained to me what I never could account for hitherto, my failing to raiſe plants from ſeed, that I ſuppoſed was of the very beſt ſort, in ſo many caſes, for theſe laſt ſeven or eight years, though attempted at different ſeaſons: the Seeds of all the ſeven Plants looked alike. It likewiſe appears neceſſary from my experience, if you want to raiſe many Plants, that thoſe marked for ſaving the Seed, ſhould have the ſurface of the Ground ſtirred at their Roots about the time of ſeeding, and made ſo clean that it need not be touched before Midſummer following, as the Seeds that are ſhed, not only produce plenty of Plants in the Autumn, but in the following Spring, yet

of

of ſo tender a nature, and ſo apt to loſe their Leaf ſoon, that you would ſuppoſe you had loſt them; and certainly muſt do ſo, if the Ground be ſtirred afterwards, until the Plants can bear tranſplanting, I mean about Midſummer, when the Autumnal Plants have acquired great ſtrength, and the Spring ones that have remained in the Ground all the Winter, have got ſtrength enough to admit of tranſplanting.

By ſuch attention, it appears to me, that in deep mould (carrot grounds) you may fill your Grounds with as many fine, proſperous and advantageous Plants as you can reaſonably deſire.

By my calculation, in ſuch Grounds as I have deſcribed, you may obtain at the end of ſix or ſeven years, when the Plant ſeems to have arrived at its perfect ſtate, one pound of Rhubarb from every five pounds of the green Roots, beſides an equal or larger proportion of Roots fit for your

your family, or powder in the Chemiſts ſhops; and many of the Roots ſhall weigh above twenty pounds weight when taken up. I think you can ſcarcely mention any Crop more likely to recompenſe the owner than the abovementioned, beſide the ſatisfaction of contributing to furniſh in plenty, and at a moderate rate, one of the moſt uſeful and beſt Drugs in the whole market of Phyſic.

I am, Sir,

Your moſt obedient humble ſervant,

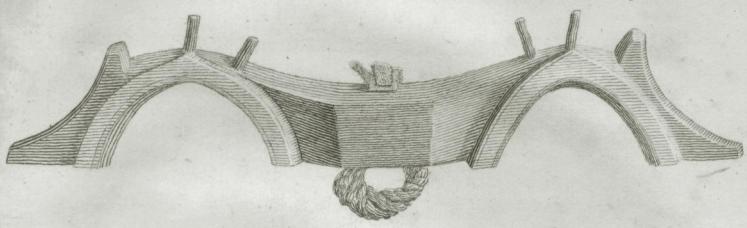
Mr. MORE.

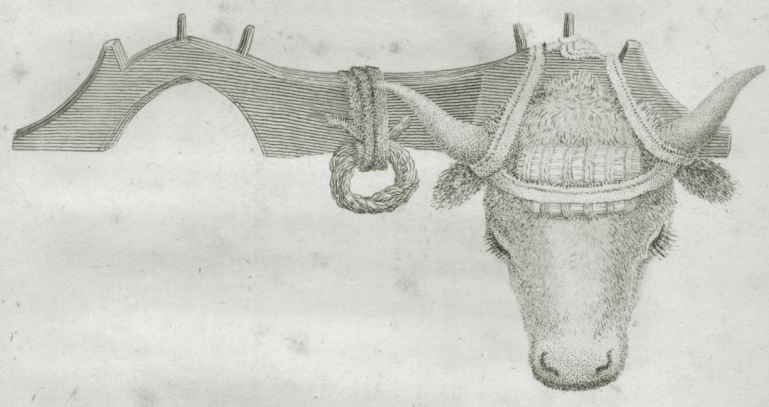
WILLIAM FORDYCE.

Warwick Street, Golden Square, Nov. 20, 1780.

In

ROMAN OX YOKE.





Scale of Inches.

1 2 3 4 5 6 12 15

In the Year 1776, *the Gold Medal was voted to Mr.* (*James Black*) *for introducing the Uſe of the Roman Ox Yoke.*

Part of this Paper has been already publiſhed by the Author, in his Eſſay on the Tillage of the Earth; but as the following Account is more full than that printed by him, it has been judged proper to inſert it here, more eſpecially as the Subject treated therein has been conſidered by many Gentlemen who have applied themſelves to Agriculture, as an Object of very conſiderable Importance.

My Lords and Gentlemen,

HAving Occaſion to increaſe my Team for Wheat-ſowing, and knowing by experience the great expenſe of horſes, I determined to work a Team of Oxen.

I had for many years abroad, uſed the Roman Ox Yoke, and was in a great mea-

ſure convinced of its ſuperiority to any other, and therefore determined to give it a fair trial.

I had two Bulls riſing to three years old, which I ordered to be cut: in fourteen days after, I yoked them myſelf, with the aſſiſtance of a Friend, and they performed as follows, according to a memorandum of Thursday, September 21, 1775.

The two Bull Steers, riſing three years old, were put, Thurſday 14th, in the evening, to the Cart for one hour.

15th, Friday, They, and the two old Devonſhire Oxen, brought home two Ploughs and Harrows over the Common in the Cart.

19th, Tueſday, Brought about twelve hundred of Chalk from Mr. Warren's Chalk Pit, at Cheam.

Note, The old Oxen, having always wrought with a Bow, keep their Noſes to the

the ground, to let it act on their Necks, and of conſequence could not draw with all their power; the Steers, young and fooliſh, refuſed the dead Pull out of the Pit. Mr. Warren's Team drew us out of the Pit, and then we came well home.

Friday, 22d, This day brought from Howell-hill, four miles diſtant, five hundred Bricks; weight of five Bricks, thirty pounds; whole weight of the Load, three thouſand pounds.

Monday, 25th, They harrowed over a Ley, ploughed up, of two Acres, three times.

Tueſday, 26th, Ditto on the ſame Ley.

Wedneſday, 27th, Thurſday, 28th, and Friday, 29th, They harrowed ten Acres of Ley, ſowed to Wheat four times in a place, equal to forty Acres once.

Saturday, 30th, The field not being ſufficiently harrowed on ſome parts of it,

the four Horſe team, and Ox team, went once over again, and finiſhed it.

Monday, 2d of October, The Horſe team, and four Ox team, harrowed ſeven Acres and a half Ley to Wheat, the half of which was harrowed five times in a place.

	Times	Times
Say 3 Acres	4 equal to one Acre	12
$3\frac{1}{2}$	5 equal to one Acre	$17\frac{1}{2}$
Equal to one Acre		$29\frac{1}{2}$

The Pace of the Oxen at Harrow, ſeems to be very near as quick as that of Horſes at Harrow.

On Thurſday, 5th, For the firſt time, they went to Plough, in a Ley of clay ſoil, and continued at Plough with the Horſes every day.

The pace of theſe Oxen at Plough, in this moſt heavy work, for four Horſes, ſeemed to be, as near as I could obſerve, as

as three to four. But it is to be conſidered that this Ox team is but a very imperfect one; the two aged Oxen working aukwardly with a Yoke totally different from what they had been accuſtomed to during four years. The Bull Steers, at thirty two months old, cannot be ſuppoſed to have acquired above half their ſtrength; add to this, that they are not matched well, being ſuch as chance threw in my way. One promiſes to become a ſtrong boney Ox, the other has nothing but his courage to ſupport him, being defective in point of largeneſs of Bone and ſtrength of Loins.

Since the ſowing of Wheat has been ended, they have continued every day at Manure-cart, or Coals, &c.

Their general Fodder is Meadow Hay, but within this week I have added thereto a few Turneps, to keep their bodies freſh.

I have not the leaſt doubt remaining, but that by giving them two hours more time, they would perform an equal work to four Horſes, in all the various occupations of Huſbandry.

They go with the Horſes to London, three or four times a week for Dung, and follow them at a gentle and laſting pace; and are relieved, the other days of the week, by more eaſy work, nearer Home.

In order to aſſiſt them, it appears in the foregoing minutes, I had bought a pair of Devonſhire Oxen, which had worked four years with the common Bow, drawing by that part of the Neck immediately before the Shoulder, where a Calloſity had formed. More pains were neceſſary to break theſe from their former ill habit than to teach the young ones

Plate 2

Fig: 1.

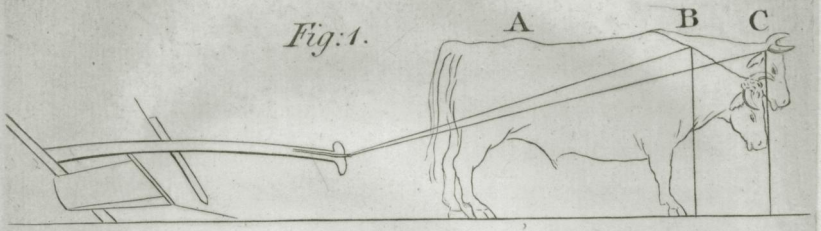


Fig: 2.

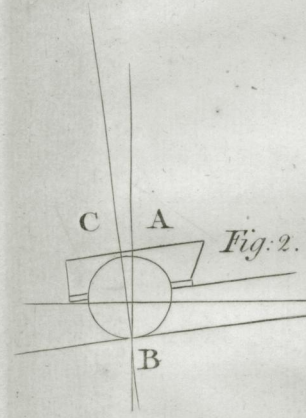


Fig: 3.

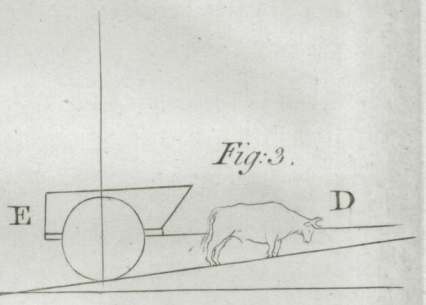
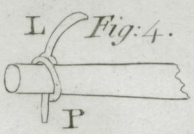


Fig: 4.



In this manner of Yokeing, the point of reſiſtance is at B. plate 2. Figure 1. and the Oxen are obliged to bend their Noſes quite to the ground, in order to form this point. If they did not, the Ring of the Bow, which goes round the Neck, would bear againſt the Shoulder, and chafe them: But beſides, this part of the Bow is evidently made ſlight, as not intended for any effort of power.

I have found ſo many advantages reſulting from my practice, that I ſhould think myſelf an unworthy member of the honourable Society, were I not to communicate what I have experienced.

The natural eaſe with which Oxen exert all their powers under the Roman Ox Yoke, is evident to every one acquainted with the uſe of this Animal, and who is ready to lay aſide prejudice, and obſerve with attention. But it may ſtill be further illuſtrated.

Obſerve in Plate 2, it is preſumed, that the main ſtrength of this Animal, as well as of moſt others, lies in the Muſcles and Sinews of the Reins and Back, and their continuations. Their ſeries is extended, ſay from A to B, Figure 1. their continuation quite to C. In drawing with the Bow, the oppoſition to the Load is at B, where a calloſity is formed thereby; in drawing with the Roman Yoke, it is at C. It follows, that in the firſt inſtance, their power may be called A B; in the ſecond, it is A, B, C; and Practice confirms this Theory.

The calloſity on the Neck cannot be formed without pain and inconvenience to the Animal, and perhaps an impairing of the muſcular Series.

Collars have been practiſed by ſome, but it ſeems clear that their uſe is attended with more difficulty, and leſs advantage than the Bow.

All

All collars made of ſoft materials, heat and chafe Oxen. Some ingenious Gentlemen have curiouſly adapted hard poliſhed wood to the ſhape of the Shoulder; but in this caſe, each Collar muſt be adapted to each Ox, and after all, ſome will chafe. Many have been decided by the authority of Columella, who declares againſt the Roman Yoke; but this was theory formed in his ſtudy, and is flatly contradicted by an Author of equal note in the Labranza Eſpaniola of Herera.

Thoſe who have uſed Oxen are clearly of opinion, that a Bull Steer ſhould not be cut until he be riſing three years old, becauſe by this means he acquires growth and ſtrength ſuperior to the animal inhumanly mutilated in the bud of life. On this head we have to combat the ſentiments of all thoſe who conſider the Ox as only yielding us food, but I will maintain, that by a too great refinement in luxury, we

we are deprived of the major part of the utility of the labouring Ox.

The commerce of the city of Bourdeaux is very extenſive. Nine tenths of the labour is performed by Oxen. Their common rate of labour is three Hogſheads of Wine brought twelve or fifteen miles, from the country to town, by one pair.

Four Hogſheads in town to and fro.

Two Pipes of Brandy, ditto.

Two Hogſheads of St. Domingo Sugar, ditto, weighing about two thouſand four hundred pounds.

Their Bull Steers are cut at riſing three years, fed with Hay during the labouring part of their lives, until they are ten or twelve years old, then fatted off. We might ſafely challenge the Beef Steak Club for a Pair, on their diſcerning between the excellence of an Engliſh Steak againſt

againſt one of theirs, there being no better Beef any where.

Let the unprejudiced compare the above practice with that of a London Team of ſix Horſes, at two hundred pounds per annum.

Some Gentlemen who uſe Oxen have objected the uneaſy and ſeeming painful ſituation of the head of the Ox under the Roman Yoke. This is ideal, and the contrary is demonſtrable.

See the annexed Plate, Figure 2, where a Cart is delineated in its poſition of going up hill. When ſuſpended by means of ſhafts on the horſes back, the angle A, B, C, is made, whereby the equilibrium contrived at loading is deſtroyed, and the reſiſtance againſt the power of Draft is augmented, in proportion to the angle B, A, C.

The Oxen, in this caſe, naturally and with mutual conſent, lower their heads, and

and preſerve the equilibrium, as at **D, E,** Figure 3, and the contrary in going down hill, having in this caſe the advantage of all other beaſts of labour.

I am no ſtranger to the uſe that Oxen make of their horns, to bruiſe and drive off inſects which attack their ſhoulders, at the ſame time that they defend the poſterior parts of their bodies with their tails, but againſt this trifling inconvenience, a netting is a remedy obvious to the humane.

The Foot Plough ſeems to be the fitteſt for Oxen. Wheels adapted inſtead of the Foot, are apt to clog, and it is more out of that road of ſimplicity, which is the true walk of Agriculture.

The ſimplicity of the whole Apparatus, when Oxen are uſed, muſt be a great recommendation of them in the carriage of materials, or tranſporting of earth or manure. A ſmall Tumbrill, of the capacity of a ton and a half weight of earth or dung,

is

is the proper ſize for one Pair; having a pole which goes through the Iron Ring of the Yoke, and fixed by a Linch Pin, as repreſented when the draught will be ſeen to be at P, Figure 4, by the lower part of the Ring, and the Recoil by the upper at L.

The Ox gives us his labour; the expenſe of his keep, compared with that of the Horſe, is as one to two; and after his labour, when fat, he is worth two ſhillings per ſtone.

The Horſe is, as to his keep, as two to one, diminiſhes in value every year; at laſt his Skin is ſold for five ſhillings.

I have annexed hereto an exact Drawing of the Roman Yoke, and am,

My Lords and Gentlemen,

with profound reſpect,

Your moſt obedient humble ſervant,

Mordon, Dec. 1, 1775.

JAMES BLACK.

To the Society for the Encouragement of Arts, &c.

Thanks were returned to Mr. Tugwell for the following Communications reſpecting the Culture and Uſe of the Turnep-rooted Cabbage. See his Paper on the ſame Subject, Vol. I. *page* 144.

Beverſtone, Nov. 21, 1783.

SIR,

I Muſt beg leave to inform you, that we continue to experience great numbers of ſheep may be ſuſtained by means of the Turnep-rooted Cabbage; while the ſoil, from the quantity of manure they neceſſarily leave behind them, becomes in a high degree enriched. From an early conviction hereof, I always preſumed it would in time become of the utmoſt conſequence to the community, and that it only wanted to be generally known to be univerſally approved; hence, and from your information of having publiſhed the account I ſometime ſince tranſmitted you of

of its culture and expenditure, I have taken the liberty of ſending you ſome corrections of what was then prematurely advanced, and of annexing a few curſory remarks on its Nature and Properties, that would of courſe accrue from the experience of the intermediate times.

The drilling the Seeds in the Seed Bed, as formerly recommended, is probably a good method; we however, as yet, continue to throw at random a Pound on twelve or fourteen Roods of ground about the middle of April; which, if the Land is clean and properly manured, will probably furniſh Plants ſufficient for five or ſix Acres, when planted out. We now find it convenient, not to have the Seed Bed two years following on the ſame ſpot, for although the crop of the ſecond year may ſometimes, in appearance, be equal to that of the firſt, yet when drawn, they will be found in number greatly deficient.

If

If before Midſummer, the time for tranſ- planting them, they advance too faſt in their growth, or if their Stems are draw- ing out to an improper length, we begin drawing them at one ſide of the bed, and regularly turning over the earth whereon they ſtood, four or five inches deep with a ſpade, lay them along the trench, for- ty or fifty in every yard, and turning over the earth of the next ſpit, upon their roots, we tread it down and continue dig- ging till another Trench is formed, at about twenty inches diſtance from the firſt, to be ſupplied in the like manner with Plants, the next at hand from the Seed Bed, till thus regularly proceeding, all are moved that require it. This checks their growth, and renders them leſs lia- ble to injury, when removed to the Field. This operation, however, if the ſoil and manure are both tolerably free from other ſeeds, will be very ſeldom found ne- ceſſary.

Having

Having drawn them from the Seed Bed to be tranſplanted in the field, we find it convenient (the expenſe being trifling) to tie them up in bundles of eight or ten inches diameter, with five or ſix wheaten ſtraws each. A ſheaf with the ſhort ears combed away, the grain knocked out, and the ſtraw a little moiſtened with water to toughen it, will tie bundles enough for many Acres. I formerly condemned the tedious method of dipping the roots ſingly into earth and water, when drawn from the Seed Bed, to preſerve them from the injuries of the air: we now, however, with great facility, plunge theſe bundles in a tub of water, ſtanding by for the purpoſe, which naturally adhering to their roots, forms of itſelf a kind of mummy, probably of conſiderable ſervice. The bundles being placed cloſely, Layer over Layer, (the firſt Layer with their roots upwards, the next reverſed, and ſo on to the top) in a Cart or Waggon, many

thouſands more will be conveyed to a diſtant field, than could be done by throwing them promiſcuouſly into the Carriage. They are alſo found more convenient; for women or children, taking each a bundle on the left arm, drop them, at proper diſtances along the tops of the ridges, while the dibblers, either men or women, one to a ridge, follow after, and with the common Dibble, or ſetting Pin, plunge them up to their leaves, and cloſe them firm in the Mould. Behind theſe are ſeen ſometimes the maſter or ſuperintendant, gently tugging at the leaves of the inſulated Plants, and when they are found looſe or irregularly planted, uſing his authority to prevent it. If more bundles have been brought to the field than can be planted in one day, they are laid along ſome Furrow, and a little earth raked down upon their roots from the adjoining Ridge. The proceſs thus far, excluſive of raiſing the plants, will after a little expe-

experience, be found to coſt from two to three ſhillings an acre, according to circumſtances.

I formerly recommended the making a heap of dung for the Plantation, in the field where the Plants are to ſtand, by means of ſheep folded on ſtraw. It will be here neceſſary to obſerve, that a load of raw horſe dung ſhould be frequently taken from the ſtable door, and ſtrewed over the field, this turned up together, when the ſheep are taken away, will promote a fermentation, and furniſh a Manure, which, without it, will not at all times be procurable in due ſeaſon. The beſt ordinary manure for this Vegetable, is a compoſt of earth and dung, ſand for clay, and clay for ſand, if convenient to be had. Any common earth or turf however, in or near the field, will perhaps be moſt eligible to have recourſe to. If Lime is procurable, I would recommend

a mixture of it with the above earth; alſo turf, pond-mud, ditch-earth, &c. and theſe having lain ſix or eight months to have dung mixed with them, in Layers, and thus to remain a year longer before they are uſed: turning them, however, during the latter period, two or three times carefully over. This, though ſomewhat expenſive at firſt, if applied on an impoveriſhed field, and the ſame planted immediately with the Turnep-rooted Cabbage, I am perſuaded would ſoon convince the owner of the utility of the practice.

When we firſt uſed this Vegetable as food for ſheep, we perceived ewes and lambs did not ſucceed ſo well, without a backward run on ſome adjoining paſture, as what we term dry ſheep, (viz. wethers, barren ewes, &c.) indeed we now find a remedy for that inconvenience, in making a few ſmall holes in the hurdles, through which the lambs run on to feed on the produce of the field at large; this they are very

very fond of, and while it is obviouſly of the utmoſt ſervice to them, we conſider the method to be no leſs ſo with the remaining bulb of the Plant, when from changes in the weather it would otherwiſe be liable to vegetate.

Whenever too ſmall a quantity of land has been appropriated to this culture, if ewes appear not to keep pace in point of condition with their lambs thus treated, a ſmall quantity of hay, or a backward run on paſturage, will ſoon ſet all right. It is a good maxim to let theſe have a forerunning, and to let dry ſheep clean up behind them.

As our earlieſt method of feeding was perceived not to be agreeable to young lambs, and as it was ſuppoſed the enſuing barley crops would be greatly injured by the ſeed being kept too long out of the ground, I adviſed as a remedy for both, that the roots might ſometime in April,

be hawled to an adjoining paſture; I now, however, from further experience, beg leave to retract that ſentiment *.

The removal of twenty or twenty-five tons of theſe roots, beſides the dirt neceſſarily adhering to them, from every acre, is attended with no ſmall labour and expenſe, and we now find our ſubſequent Barley crops, (although ſown later than in any other caſe has ever been heard of) to be generally ſuperior to thoſe we can raiſe in any other way. We think it œconomy, however, always to ſow Barley procured from the iſle of Thanet, to raiſe ſeed from, for the general crop of the next year. If in its luxuriancy the preſent crop happens to become lodged, (frequently an evil not to be prevented) and in conſequence, thin in the grain; if the latter prove coarſe

* On wet Lands, the practice must necessarily be continued. These, however, may frequently be greatly benefited by the method prescribed by Mr. Tull; I practise it myself, with some improvements, and much success.

of

of ſkin, which alſo from the rankneſs of the ſoil, is ſometimes the caſe; or finally, being lateſt at harvest; if from rains, or the length and dews of the nights, it ſhould become blackened thereon; while, in either caſe, it ſtands depreciated in the eye of the maltſter, it will nevertheleſs remain as valuable in the hands of the farmer.

I have heard it intimated, that this Plant has not been found to ſucceed ſo well in general in warm ſituations and on rich ſoils, as in countries more ſteril and expoſed *. If I durſt venture to credit ſuch a report, I ſhould think it a flattering prognoſtic of the ſucceſs of the culture in the northern counties. I have been told indeed, that the Plant came originally from Lapland; and if ſo, I think the myſtery in part diſappears: nor perhaps till trials have been made, can our

* The better my Land the better the Crop.

expectations riſe too high of the practicability of its being raiſed to advantage, on the Lands even of Scotland at large, and all the Engliſh Wolds. Sir Digby Legard informs us, that the common Turnep cannot be raiſed in thoſe of Yorkſhire. This we preſume muſt be in ſome degree owing to its tenderneſs; and if ſo, there would certainly be great propriety in making trial of this as a ſuccedaneum; being infinitely more hardy, and leſs affected by froſt.

It continues annually to be cultivated to great profit intrinſically; nor are our ſubſequent Barley Crops ever known to fail. The benefits that have accrued to this Kingdom from the cultivation of the common Turnep, ſince its introduction for feeding of ſheep, are too well known to be here enlarged on; however, if on Lands too exposed to admit the growth of the common Turnep, the Turnep-rooted Cabbage,

Cabbage ſhould happily be found to ſucceed, it will then promiſe fair for becoming, ere long, an endleſs ſource of wealth to theſe Iſlands; being even in ſituations peculiarly favourable to the common Turnep of conſiderably more value, and always affording a moſt liberal ſupply of ſheep-food, when neither they nor any other vegetable, we know of, can with ordinary propriety be depended on.

In the year 1781, the land being moiſt, and the ſeaſon extremely wet, my Ploughs were kept out till late in June, when hawling great part of the Turneps, (more than a fourth of the whole) to a diſtant field, I ploughed them in, and on the 18th of that month, ſowed my Thanet Barley, a full month later than any I had ever heard of before. Our Crops were that ſeaſon bad in general, this, however, turned out in meaſure, one third more than any other I had, though all my others ſucceeded Turneps, &c. fed off with ſheep. A neigh-

neighbour of mine having that year four Acres on a dry ſoil, he informs me it kept three hundred ſheep for a month, and ſerved them well. He is a man of veracity, and has his field adjoining to my farm; I had ocular teſtimony of the greateſt part of the matter. He kept no field account; but from the beſt information I can get, his Barley Crop turned out between five and ſix Quarters per Acre, which nearly doubled that of any other field he had, although ſome adjoining, naturally more fertile, and equally dunged before the Fallow Crop were ſown, (after Turneps) two months ſooner. The ſeeds of this Crop, as near as I can gather, were ſown on or about the 14th of June.

Having a ſcantineſs of Paſturage, he was always induſtrious in endeavouring to ſupport his ſheep from the produce of his Arables. Thus through the Summer Seaſon they were ſoiled, Firſt, on the

the Winter Vetch; Secondly, on the Summer ditto; Thirdly, on Clover in the ſame way; and laſtly, a range at large on Clover aftermath. Hence, for the Winter ſeaſon, they were conducted, Firſt, to a field of Rape, hurdled out; Secondly, Turneps in the ſame way; Thirdly, the Rape Stalks recurred to; and laſtly, alas! an almoſt total ſuſpenſion; during which, his Paſtures and Clover Crops, were peeled to the earth; the firſt being greatly injured thereby, and the latter, if a dry ſeaſon ſucceeded, rendered of little value through the enſuing Summer. His Wheat Crops were likewiſe frequently injured in the ſame way, and after all, the ſheep ſo ſtinted, as with difficulty to recover their fleſh again during the enſuing ſeaſon.

By means of his Turnep rooted Cabbage, all theſe evils are now at once obviated, and the ſheep having conſumed that Crop, are immediately conducted to a field

of

of Vetches (forced by dung) and thus early made ready to receive them. Moreover, he now informs me of a circumſtance I may indeed have heard of, but never reduced to practice before, (viz.) That his Wether Lambs have hereby been reared to the age of eighteen months, then ſold for as much as any in the neighbourhood, and this without ever once having brought their mouths in contact with the ſurface of his natural Paſtures. I beg leave to ſubſcribe myſelf,

Sir,

Your obedient humble ſervant,

LEWEN TUGWELL.

P. S. The Plant is amazing prolific of Seed, which appears to abound with oil.

Mr. MORE.

CHEMIS-

CHEMISTRY.

Rewards beſtowed by the Society for Diſcoveries and Improvements in Chemiſtry, Dyeing and Mineralogy, from the Year 1775, to the Year 1782, incluſive.

1775 BLACK WOOLLEN DYE improved. To Mr. Thomas Vincent, THE SILVER MEDAL.

1775 BRITISH IRON, for his improvement of. To Mr. John Bedford, TWENTY GUINEAS.

1775 MERCURY IN WATER GILDING. To Mr. J. Hills, for his method of preventing the ill effects of, TWENTY GUINEAS.

1776 BLACK LEAD imported for making melting Pots. To Meſſrs. Ruhl, Hempel, and Co. THIRTY POUNDS.

1777

1777 QUICK MATCH, for making from Vegetables. To Mr. Jervas Simcock, FIVE GUINEAS.

1778 TANNING LEATHER. To Dr. Mac Bride, for his improvement in, THE GOLD MEDAL.

GLASS FOR GLAZING PRINTS. To Mr. George Enſell, FIFTY POUNDS.

1779 WHITE TOUGH IRON, for improving. To Mr. John Bedford, THE SILVER MEDAL.

1781 HYDROMETER, for his improvement of. To Mr. Matthew Quin, THE SILVER MEDAL.

1782 VERDEGRIS, for an account of a ſubſtitute for. To Mr. James Clegg, THE SILVER MEDAL AND TEN GUINEAS.

PAPERS IN CHEMISTRY.

The Society having received Information, that in Germany and other parts of Europe, and alſo in America, large Quantities of Oil were extracted from the Seeds of the GREAT *annual* SUN FLOWER, *offered a Premium for the Culture of that Plant in England, in Order to aſcertain whether Oil could be advantageouſly obtained from the Seeds in this Climate—and in the Year* 1776, *the pecuniary Premium, Twenty Pounds, was adjudged to the Rev. Henry Bryant of Heydon, in Norfolk, from whom the following Letter was received.*

Heydon, Nov. 24, 1775.

SIR,

THIS is to acquaint you that I have ſent fifteen buſhels of Sun Flower ſeed this morning from Heydon to Norwich, to be forwarded from thence to London by the Stage Waggon, the firſt

opportunity, directed to you at the Adelphi, and hope they will come ſafe to hand, and in good time.

The Society need not be under any apprehenſion of the leaſt fraud or colluſion in the buſineſs, for as I undertook it not for private advantage alone, but rather for a public good, I think myſelf almoſt as much intereſted in the event, as they themſelves can be. Two queſtions ſeemed to be depending well worthy of particular enquiry, and a very careful attention, to which few perſons could be more inclined to do juſtice than myſelf. The one is, whether the ſeed of the great annual Sun Flower, as ſet forth in the American Tranſactions, will yield an Oil ſweet and well-flavoured; and the other, whether it will give it in ſuch a quantity as to merit encouragement for the cultivation of that Plant in this Kingdom. The former muſt be determined firſt, and will ſoon be, I truſt, before the members of

of your Society; when they are ſatisfied about that, then I ſhall be ready to give them any ſatisfaction about the other which they ſhall be pleaſed to require of me.

I am, Sir,

Your and their moſt

obedient humble ſervant,

Mr. MORE.

HENRY BRYANT.

It has been judged proper to add to the foregoing Letter, the account received from Mr. Barrow of the proportion of Oil obtained from a given quantity of the Sun Flower Seeds, and the Thanks of the Society were given to Mr. Barrow for his account of Experiments made by him on that ſubject.

Twickenham Common, June 2, 1779.

SIR,

I ſome time ſince finiſhed the trial of the Sun Flower Seeds, in which I was exceedingly diſappointed, both in the quality and quantity of the Oil produced, which I attribute in a great degree to the thick huſk which covers the Kernel of the Seed, and by its ſpongy quality, ſucks in and retains the Oil; alſo a black gummy matter it contains, diſcolours the little Oil that can be expreſſed.

In all preſſing of Seeds for Oil, it is uſual to preſs them twice over; in the firſt operation, in general, two thirds or more of the Oil is obtained; when the Cake being ground, is again preſſed for the remainder. In the trial of this Seed, which I attended myſelf, not one twentieth of the very ſmall produce was obtained in the firſt preſſing.

The

The quality of the Oil is ſimilar to that of Linſeed, and could the Huſk be taken off, would be at leaſt equal to it in colour, but though I think it very poſſible, by ſome ſuch operation as making Grotts, to clear away the Huſks, yet I do not think it would anſwer the trouble; as ſuch, I am of opinion the Sun Flower by no means worth cultivating for the purpoſe of making Oil in this Country.

Annexed you have the Account of the Produce.

I am, Sir,

your moſt obedient ſervant,

CHARLES BARROW.

	cwt.	qrs.	lb.
Eight Buſhels one Peck Sun Flower Seed weighed	1	3	23
Produce in Cakes	1	3	6
Oil - -	0	0	9
Loſs - -	0	0	8
	1	3	23

Mr. MORE.

In the Year 1777, *A Bounty of five Guineas was given to Mr. Jervis Simcock, for diſcloſing his Invention of impregnating Hemp or old Rope with the Juice or a ſtrong Decoction of various Herbs, in order to convert ſuch Rope or Hemp into Slow Match.*

This was performed in preſence of the Committee, by boiling Rope in a ſtrong Decoction either of Hay, Nettles, Cabbage, &c. and notwithſtanding this Invention was found ingenious, and in ſome Degree new, yet as it did not promiſe to afford a cheaper or better Match than that commonly uſed in the Army and Navy, the Society did not think proper to give it further Conſideration, nor beſtow on the Inventor any greater Reward; but as in ſome Caſes the Knowledge of this Fact may be of Uſe,

The following Letters received from Mr. Simcock on the Subject, are ſubmitted to the Public; and ſome Specimens of Match thus made, are reſerved in the Society's Repoſitory.

SIR,

SIR,

I Now lay before the honourable Society for the Encouragement of Arts, Manufactures, and Commerce, a method of making Match for military purpoſes in ſo cheap a way, as the converting a Ton Weight will not coſt one Shilling; and if it be conſidered what quantity is uſed in the Merchant's ſervice, as well as in the Royal Navy, it may tend to a ſaving of national expenſe, eſpecially in time of War.

I am, Sir,

Your very humble ſervant,

WILLIAM JERVAS SIMCOCK.

Dec. 3, 1776.

Mr. MORE.

SIR,

In my reſearches to diſcover and analyze phlogiſtic ſubſtances, at Mr. Dean's Elaboratory, Granby-Row, Dublin, I collected ſome very uſeful hints for converting the Tow of Hemp or Flax into Match for military purpoſes, even to excel that made by the Dutch; and conſidering what quantity is uſed in time of war, this invention may be of uſe to the public. I ſhall do myſelf the honour of bringing for your inſpection ſome different ſubſtances impregnated, and beg that you will report it to the Society for the Encouragement of Arts, Manufactures and Commerce.

I am, Sir,

Your very humble ſervant,

WILLIAM JERVAS SIMCOCK.

Dec. 4, 1776.

Mr. MORE.

SIR,

SIR,

The ſubſtances No. 1. are inflammable, like Match, and are made ſo to ſhow you that the impregnating ſubſtance makes theſe things burn ſlow. There are like ſubſtances, No. 2, unimpregnated. By ſetting fire to the end of each, you will diſcover the difference.

I am, Sir,

Your very humble ſervant,

WILLIAM JERVAS SIMCOCK.

Dec. 8, 1776.

I beg to remark that neither Sulphur or Nitre, is made uſe of; and the things uſed are very cheap and plentiful.

February

February 22, 1777.

HONOURABLE SIRS,

Purſuant to my propoſal of the Slow Match uſed by the Military, at Sea and Land, have prepared the Dutch Menſtruum for your inſpection, which I obtained by a tedious decompoſition. You may, by uſing the Menſtruum, compoſe Match equally as good as the Dutch. But, Gentlemen, I have proceeded further; I make Menſtruum both better, and cheaper, and beg that it may be ſtrictly conſidered what quantity is uſed in War, and of what ſervice it may be to my country. At the ſame time, I further humbly pray for your ſpeedy encouragement, to enable me to produce ſomething of more utility, and more worthy of your attention.

I am, Honoured Sirs,

Your very humble ſervant,

WILLIAM JERVAS SIMCOCK.

To the Society for the Encouragement of Arts, &c.

March 22, 1777.

HONOURABLE SIRS,

According to your deſire I have extracted the Juice of ſome phlogiſtic Vegetables, for for the purpoſe of making Match, and I have collected ſeven ſorts from the Plants growing in the common fields near London. There are many more of no expenſe but the gathering, but theſe are all I can get at this ſeaſon. The uſe of Match is not wholly confined to the Military. It has been hinted to me by an eminent Phyſician, that Match may be uſed where a conſtant light is hurtful to a patient, if placed to burn in a grate conveniently coiled, at which a candle may be lighted when it is neceſſary to have one, without any noiſe, and in an eaſy manner. I beg to inform you that I had a conſiderable ſum offered me for the ſecret, by an American, which I refuſed in regard to my country.

I am, Sirs,

Your very humble ſervant,

WILLIAM JERVAS SIMCOCK.

To the Society for the Encouragement of Arts, &c.

POLITE ARTS.

Rewards beſtowed by the Society for promoting the Polite and Liberal Arts, from the Year 1775, to the Year 1782, inclusive.

1775 DRAWINGS AFTER PICTURES. To Mr. James Hog, THE GREATER SILVER PALLET.

PATTERNS FOR CALLICO PRINTERS. To Mr. Robert Laurie, FIVE GUINEAS.

DRAWINGS OF FLOWERS. To Miſs Diana Dietz, THE GREATER SILVER PALLET, and FIVE GUINEAS.

DRAWING AND ENGRAVING FRONTISPIECES. To Mr. John Keyſe Sherwin, TWENTY POUNDS.

1775 DRAWINGS OF MACHINES. To Mr. William Malton, TEN GUINEAS.

DRAWINGS OF BEASTS. To Mr. Joſeph Barret, THE GOLD PALLET.

DRAWINGS OF OUTLINES. To Miſs Ann Smith, THE GREATER SILVER PALLET.

DRAWINGS OF OUTLINES. To Mr. James Durand, THE LESSER SILVER PALLET.

CARVING IN WOOD. To Mr. Ralph Terry, THREE GUINEAS.

ENGRAVING IN WOOD. To Mr. William Coleman, SEVEN GUINEAS.

ENGRAVING IN WOOD. To Mr. Thomas Bewick, SEVEN GUINEAS.

1775 ENGRAVING IN WOOD. To Mr. Thomas Hodgſon, SIX GUINEAS.

MODEL OF A CHANDELIER. To Mr. — Gouron, FIVE GUINEAS.

MODEL OF A HUMAN FIGURE as large as Life. To Mr. John Charles Lochéé, THIRTY GUINEAS.

MODEL OF AN HUMAN FIGURE. To Mr. James Gheys, FIFTEEN GUINEAS.

1776 DRAWINGS OF LANDSCAPES. To Mr. William Auguſtus Baron, THE GOLD PALLET.

DRAWINGS OF LANDSCAPES. To Mr. Robert Barret, THE GREATER SILVER PALLET.

DRAWINGS OF LANDSCAPES. To Mr. John Feary, THE LESSER SILVER PALLET.

1776 PATTERNS for Callico Printers. To Mr. Robert Laurie, TEN GUINEAS.

DRAWINGS AFTER PICTURES. To Mr. Peter Denys, THE GREATER SILVER PALLET.

HISTORICAL DRAWINGS. To Mr. William Martin, THE GOLD PALLET.

DRAWINGS OF MACHINES. To Mr. James Hunter, FIVE GUINEAS.

ENGRAVING ON WOOD OR TYPE METAL. To Mr. William Coleman, TEN GUINEAS.

MODEL OF A HUMAN FIGURE. To John Bacon, Eſq; FIFTY GUINEAS.

HONORARY DRAWINGS. To the Honourable Miſs Egerton, THE GOLD MEDAL.

1776 HONORARY DRAWINGS. To Mr. William Maſon, THE SILVER MEDAL.

DRAWINGS OF LANDSCAPES. To Mr. Thomas Hearne. THE GOLD PALLET.

DRAWINGS OF LANDSCAPES. To Mr. Charles Tomkins, The GREATER SILVER PALLET.

DRAWINGS OF OUTLINES. To Miſs Ann Smith, THE LESSER SILVER PALLET.

DRAWINGS AFTER PICTURES. To Mr. Thomas D nys, THE GREATER SILVER PALLET.

DRAWINGS AFTER PICTURES. To Mr. William Artaud, THE LESSER SILVER PALLET.

DRAWINGS OF BEASTS. To Mr. Bernard Paul, THE GREATER SILVER PALLET.

DRAW-

1776 DRAWING OF A VENUS. To Mr. Alexander Monies, THE LESSER SILVER PALLET.

DRAWING OF RUINS. To Mr. Robert Hopkinſon, THE GREATER SILVER PALLET.

FOR DISCLOSING HIS METHOD OF PRINTING MEZZOTINTO PRINTS IN COLOURS. To Mr. Robert Laurie, THIRTY GUINEAS.

1777 DRAWINGS OF LANDSCAPES. To Mr. Julius Tidd, THE LESSER SILVER PALLET.

DRAWINGS OF MACHINES. To Mr. William Malton, TEN GUINEAS.

HISTORICAL DRAWINGS. To Mr. Richard Samuel, THE GOLD PALLET.

HONORARY DRAWINGS. To the Rt. Hon. Lord St. John, THE SILVER MEDAL.

1777 HONORARY DRAWINGS. To the Honourable Miſs Worſley, THE GOLD MEDAL.

HONORARY DRAWINGS. To the Honourable Miſs St. John, THE SILVER MEDAL.

HONORARY DRAWINGS. To the Honourable Miſs Egerton, THE GOLD MEDAL.

HONORARY DRAWINGS. To Miſs Greenland, THE SILVER MEDAL.

HONORARY DRAWINGS. To Mr. Francis Perigal, THE SILVER MEDAL.

HONORARY DRAWINGS. To Miſs Louiſa Leignes, THE SILVER MEDAL.

DRAWINGS OF OUTLINES. To Mr. Henry Hudſon, Junior, THE LESSER SILVER PALLET.

1777 DRAWINGS OF LANDSCAPES. To Mr. Joſeph Barret, THE GOLD PALLET.

DRAWINGS OF LANDSCAPES. To Mr. Julius Tidd, THE GREATER SILVER PALLET.

DRAWINGS OF LANDSCAPES. To Mr. Thomas Medland, THE LESSER SILVER PALLET.

DRAWINGS AFTER PICTURES. To Mr. William Artaud, THE GREATER SILVER PALLET.

DRAWINGS AFTER PICTURES. To Mr. Lewis George Mackenzie, THE LESSER SILVER PALLET.

DRAWING AND ENGRAVING HEAD AND TAIL PIECES FOR BOOKS. To Mr. Edward Malpus, TEN GUINEAS.

ENGRAVING ON WOOD OR TYPE METAL.. To Mr. William Coleman, TEN GUINEAS.

1777 MODEL OF A NAKED HUMAN FIGURE. To Mr. Thomas Engleheart, TWENTY-FIVE GUINEAS.

MODEL OF A HUMAN FIGURE WITH DRAPERY. To Mr. —— Gahagan, TWENTY GUINEAS.

SURVEY OF THE ISLAND OF MINORCA. To Mr. Aſſiotti, TEN GUINEAS.

1778 HISTORICAL DRAWINGS. To Mr. Robert Watſon, THE GOLD PALLET.

HONORARY DRAWINGS. To the Honourable Miſs St. John, THE GOLD MEDAL.

HONORARY DRAWINGS. To Mr. Francis Perrigal, THE SILVER MEDAL.

HONORARY DRAWINGS. To Miſs Jane Harry, THE GOLD MEDAL.

HONORARY DRAWINGS. To Miſs Greenland, THE SILVER MEDAL.

1778

1778 DRAWINGS OF OUTLINES. To Mr. John Spiller, THE GREATER SILVER PALLET.

DRAWINGS OF OUTLINES. To Mr. Henry Hudſon, THE LESSER SILVER PALLET.

DRAWINGS AFTER PICTURES. To Mr. James Franks, THE GREATER SILVER PALLET.

DRAWINGS AFTER PICTURES. To Mr. William Skelton, THE LESSER SILVER PALLET.

DRAWINGS OF BEASTS. To Mr. Thomas Gooch, THE GREATER SILVER PALLET.

MODEL OF A HUMAN FIGURE. To John Bacon, Eſq; FIFTY GUINEAS.

HONORARY DRAWINGS. To Mr. John Thomas, THE SILVER MEDAL.

1778 MAP OF BOSTON IN AQUA TINTA. To Mr. Francis Jukes, TEN POUNDS.

EXCELLENCE IN ENGRAVING. To Mr. John Keyſe Sherwin, THE GOLD MEDAL.

SURVEY OF LEICESTERSHIRE. To the Reverend John Prior, THE SILVER MEDAL, and TWENTY GUINEAS.

1779 HONORARY DRAWINGS. To the Right Hon. Lady Laura Waldegrave, THE GOLD MEDAL.

HONORARY DRAWINGS. To Mr. Thomas Perigal, THE SILVER MEDAL.

HONORARY DRAWINGS. To Miſs Greenland, THE GOLD MEDAL.

HONORARY DRAWINGS. To Miſs Louiſa Leignes. THE SILVER MEDAL.

1779 DRAWINGS OF LANDSCAPES. To Mr. Joſiah Smith, THE GOLD PALLET.

DRAWINGS OF LANDSCAPES. To Mr. Thomas Medland, THE GREATER SILVER PALLET.

DRAWINGS OF LANDSCAPES. To Mr. James Irvine, THE LESSER SILVER PALLET.

HISTORICAL DRAWINGS. To Mr. Richard Samuel, THE GOLD PALLET.

LANDSCAPE PAINTING. To Mr. Thomſon, THIRTY GUINEAS.

HISTORICAL PAINTINGS. To Mr. John Downman, TWENTY GUINEAS.

DRAWINGS AFTER PICTURES. To Mr. James Franks, THE GREATER SILVER PALLET.

1779 DRAWINGS AFTER PICTURES. To Mr. William Skelton, THE LESSER SILVER PALLET.

DRAWINGS OF FLOWERS. To Miſs Amelia Mary Dietz. THE GREATER SILVER PALLET.

DRAWINGS OF FLOWERS. To Miſs Elizabeth Burton, THE LESSER SILVER PALLET.

DRAWINGS OF A RUIN. To Mr. Robert Hopkinſon, THE GREATER SILVER PALLET.

1780 DRAWINGS OF OUTLINES. To Mr. John Spiller, THE GREATER SILVER PALLET.

DRAWINGS OF LANDSCAPES. To Mr. Thomas Medland, THE GREATER SILVER PALLET.

LANDSCAPE PAINTING. To Mr. William Martin, TWENTY GUINEAS.

1780 LANDSCAPE PAINTING. To Mr. Thomas Daniel, TEN GUINEAS.

HONORARY DRAWINGS. To the Honourable Miſs Walpole, THE GOLD MEDAL.

HONORARY DRAWINGS. To the Honourable Miſs Southwell, THE SILVER MEDAL.

HONORARY DRAWINGS. To Mr. Samuel Byron, THE SILVER MEDAL.

HONORARY DRAWINGS. To Miſs Greenland, THE GOLD MEDAL.

HONORARY DRAWINGS. To Miſs Emma Jane Greenland, THE SILVER MEDAL.

DRAWINGS OF LANDSCAPES. To Mr. P. W. Tomkins, THE GREATER SILVER PALLET.

1780 DRAWINGS OF LANDSCAPES. To Miſs Ann Smith, THE LESSER SILVER PALLET.

DRAWING OF THE DANCING FAUN. To Mr. George Graham, THE LESSER SILVER PALLET.

DRAWINGS OF FLOWERS. To Miſs Leonora De Yongh, THE LESSER SILVER PALLET.

PLANS OF PHÆNIX PARK AND MISTLEY HALL. To Mr. James Aſſer, THE GREATER SILVER PALLET.

1781 HONORARY DRAWINGS. To the Honourable Miſs Southwell, THE GOLD MEDAL.

HONORARY DRAWINGS. To the Honourable Miſs Walpole, THE SILVER MEDAL

1781

1781 HONORARY DRAWINGS. To Mr. Daniel Oliver, Junior, THE SILVER MEDAL.

HONORARY DRAWINGS. To Miſs Cook, THE GOLD MEDAL.

HONORARY DRAWINGS. To Miſs Emma Jane Greenland, THE SILVER MEDAL.

DRAWINGS AFTER PICTURES. To Mr. Thomas Cheeſman, THE GREATER SILVER PALLET.

HISTORICAL DRAWINGS. To Mr. Joſeph Barney, Junior, THE GOLD PALLET.

HISTORICAL DRAWINGS. To Mr. Guy Head, THE GREATER SILVER PALLET.

DRAWINGS FROM PLASTER. To Mr. Rupert Green, THE GREATER SILVER PALLET.

1781 LANDSCAPE PAINTING. To Mr. Edward Edwards, TEN GUINEAS.

FLOWERS IN NEEDLE WORK. To Miſs Harriot Mackintoſh, THE LESSER SILVER PALLET.

IMPROVED WATER COLOURS. To Meſſieurs Thomas and William Reeves, THE GREATER SILVER PALLET.

HONORARY DRAWINGS. To the Hon. Miſs Catharine Southwell, THE GOLD MEDAL.

HONORARY DRAWINGS. To the Hon. Miſs Caroline Walpole, THE SILVER MEDAL.

HONORARY DRAWINGS. To Miſs Emma Jane Greenland, THE GOLD MEDAL.

1782 HONORARY DRAWINGS. To Miſs Smith, THE SILVER MEDAL.

DRAWINGS OF LANDSCAPES. To Mr. Guy Head, THE GREATER SILVER PALLET.

HISTORICAL DRAWINGS. To Mr. William Artaud, THE GREATER SILVER PALLET.

DRAWINGS OF PORTRAITS. To Mr. Charles Ralph Hurter, THE SILVER MEDALLION.

Given in Conformity to the Will of John Stock, Eſq; *of Hampſtead.*

DRAWINGS OF OUTLINES. To Mr. Thomas Stewart, THE GREATER SILVER PALLET.

DRAWINGS OF OUTLINES. To Miſs Catherine Charlotte Raper, THE LESSER SILVER PALLET.

1782 DRAWINGS OF FLOWERS. To Miſs Leonora De Yongh, THE GREATER SILVER PALLET.

DRAWINGS OF LANDSCAPES. To Mr. Thomas Stewart, THE LESSER SILVER PALLET.

DRAWINGS OF LANDSCAPES. To Miſs Engliſh, THE SILVER MEDAL.

DRAWINGS OF LANDSCAPES. To Miſs Cook, THE LESSER SILVER PALLET, GILT.

PAPERS

IN

POLITE ARTS.

The following Letters contain the Account of a Method of printing Mezzotinto Prints in Colours, as communicated to the Society in the Year 1776, *by Mr. Robert Laurie; for which he received a Reward of Thirty Guineas. Specimens of the Work are reſerved in the Society's Collection for the Inſpection of the Curious.*

My Lords and Gentlemen,

YOUR great encouragement and zealous attention for promoting the Arts, emboldens me in my juvenile ſtate, to attempt ſomething out of the common way; the which I now lay before the Society for their judicious inſpection.

As the ingenious and laborious works of many eminent men, have been uſhered into the world, with inelegant and unexpreſſive Cuts, principally owing to the great expenſe attending the execution of good Engravings, I have been induced to attempt a method

method of engraving, and printing in Colours, which has anſwered my moſt ſanguine expectation, both with reſpect to the eaſe and expedition with which they are executed, and conſequently the little expenſe at which they may be afforded.

In this manner, Animals, Plants, &c. for illuſtrating Natural Hiſtory, may be finiſhed in their proper colours, very much like Drawings, and greatly reſembling nature. The Plates will alſo admit of being repaired, ſo as to furniſh a large impreſſion.

If this my firſt attempt ſhould meet your approbation, it will encourage me, under your inſpection, to proceed on a more extenſive plan.

The Bird repreſented by the Prints now laid before you, is taken from one which Captain Cooke brought from between the Tropics, caught in his laſt voyage round the world. And I beg leave to ſubmit the

the Plate, from which the impreſſions were taken, to the conſideration of the Society.

I am,

My Lords and Gentlemen,

Your moſt obedient ſervant,

Nov. 6, 1776.

ROBERT LAURIE.

No. 53, Fleet Street.

To the Society for the Encouragement of Arts, &c.

Mr.

Mr. Laurie's Explanation of his Method of taking Coloured Prints from Mezzotinto Plates.

A Copper Plate, with an etched or engraved Outline, dotted next the lights, and filled in with Mezzotinto ground, is printed in Colours, after nature, or from a picture, by the following proceſs.

The Plate being warmed in the uſual manner, the Colours are applied by means of Stump Camel hair Pencils, to the different parts, as the ſubject ſuggeſts; it is then wiped with a coarſe gauze Canvas, any other being improper; after this it is wiped clean with the hand as in common practice; and being again warmed, is paſſed through the Preſs.

The Colours are mixed with Burnt Linſeed Oil, and thoſe generally uſed by Painters are proper.

ROBERT LAURIE.

Nov. 21, 1776. Aged 20.

MANUFACTURES.

Rewards beſtowed by the Society for encouraging and improving Manufactures, from the Year 1775, *to the Year* 1782, *inclusive.*

1775 TOOLS FOR CUTTING CHIPS FOR MAKING CHIP HATS. To Mr. Robert Galloway. TWENTY-FIVE GUINEAS.

1776 IMPROVEMENT IN DYEING LEATHER. To Mr. —— Souter, TWENTY-FIVE GUINEAS.

MILLED CAPS, in imitation of the French. To Mr. —— Rowlandſon, FIFTEEN POUNDS.

FISHING NETS woven in a Loom. To Mr. Freeſtone, TWENTY GUINEAS.

1776 CHIP HATS, made at his Manufactory at Totneſs. To Mr. John Pepperell, TEN GUINEAS.

A Reward of Thirty Guineas was given in the Year 1774, *to Mr. Pepperell, for having eſtabliſhed this Manufactory.*

1778 CAMBRICK made with Thread, ſpun by herſelf. To Mrs. Mary Yates, THE SILVER MEDAL.

BREEDING AND FEEDING SILK WORMS. To Mrs. Ann Williams, TWENTY GUINEAS.

PAPERS

IN

MANUFACTURES.

The propagating Silk Worms, and obtaining Silk in England, was an early Subject of the Society's conſideration; but it has appeared from many Letters received on that Head, that the procuring a proper Food for thoſe Inſects, when Mulberry Leaves could not be got, was a Matter much wiſhed for. The Society, in the Year 1778, *gave a Bounty of Twenty Guineas to Mrs. Ann Williams of Graveſend, from whom the following Letters had been received; whoſe Attention to that Object was found to deſerve a proper Reward, and whoſe Obſervations relative to it, will, it is hoped, tend to the Furtherance of the Society's Wiſhes in a Matter which may hereafter prove of much national Importance.*

Poſt Office, Graveſend, Auguſt 5, 1777.

SIR,

I Do myſelf the honour to addreſs you to inform you that I have bred two hun-

dred and forty-four Silk Worms this year, which have produced very near one Ounce and an half of beautiful Silk of three colours, (viz.) A bright buff or gold colour, a lovely white, and an apple green. All who have ſeen it, declare they never ſaw any in ſuch perfection; and ſeveral gentlemen who have been in Italy, &c. tell me it is the fineſt they ever ſaw.

Now, Sir, if you think I ſhall have any encouragement from your Society, I will ſend you a ſample of all the colours, together with my method of treating and feeding the Nymphs before the Mulberry Leaves came in, which I believe you will find ſomething new. My little family made their appearance a fortnight before any others in this place, though there are vaſt numbers kept here; in conſequence of which, my Aurelias were amazingly larger, and had almoſt all completed their ſpinning before others had well begun.

I am, Sir, your moſt humble ſervant,

Mr. MORE. A. WILLIAMS.

Poſt Office, Graveſend, Octr. 14, 1777.

SIR,

I beg you to inform the Society I have now forty-ſeven Silk worms ſpinning, which were but one month old yeſterday; the firſt ſpan on Friday laſt, and are in fine cocoon; thoſe of Saturday, Sunday, and yeſterday, are forming them. Every perſon here, thoſe who have kept them, as well as others, will have it I have performed a miracle. I believe I could have hatched thouſands, but as I was dubious at this time of year of proviſion, I checked them; however, thoſe will ſuffice as a ſpecimen of what may be done by a watchful attendance and induſtry. If, Sir, I ſhould be ſo happy as to meet with any countenance from the Gentlemen, I will lay the whole proceſs of my managing thoſe ſweet innocent reptiles, before them; I call them ſweet as no unſavory ſmell ever attended mine, though they have ever laboured under that imputation.

I am, Sir, with great reſpect, yours, &c.

Mr. MORE. A. WILLIAMS.

Gravesend, Octr. 19, 1777.

SIR,

I am infinitely obliged by your laying my letters before your truly munificent Society; therefore with the utmost candour, acquaint you with my method of training my favourite reptiles. The sole reason of my hatching them earlier than usual was as follows: I put the papers with the Eggs, into a pidgeon-hole in a Cabinet, nearly opposite to the fire. As soon as the frost set in, I covered the hole with paper several times double, to keep out the night air; the event answered my most sanguine wishes, they came according to expectation. The query was then, how to get food for my little family, the weather being cold and very severe, and the Lettuces that were to be got, were very small, and not enough to suffice them: A thought immediately occurred: as the Blackberry had a near affinity to the Mulberry,

berry, why might they not ſerve for food? As the tender part of the leaf appears ſilky, I tried them, they eat ſurpriſingly, and grew amazingly. I muſt here remark I had them gathered from the young ſhoots, as their texture is moſt delicate, and diveſted them of their thorns without bruiſing the leaves. My reſearches, however, did not ſtop here; I next preſented them with the young and tender leaves of the Elm, which they devoured with great avidity. Cowſlip leaves, and flowers, they are very fond of; and it is really curious to thoſe who love to pry into the ſecrets of nature, to ſee how they will, when ſatisfied, neſtle into the pipes and repoſe themſelves. From hence forward, I fed them promiſcuouſly on all the aforeſaid vegetables, together with Primroſe leaves and flowers, until the Mulberry leaves came; but when I once preſented them with that food, adieu to all other, they would not touch it.

It is worthy remark, they will not touch a red flower; I tried them with roſes, polyanthus, ſweet-williams, and pinks, and they ſeemed to avoid them with a kind of horror. I ſuppoſe nature debars their feeding on them, as it might hurt the colour of the ſilk. I keep them in a woman's large hat box, feed them every day at Ten o'clock; at Four in the afternoon, and Eleven at night; keeping them very clean. When I clean them, I remove them as follows: In a Morning they are always upon the leaves, I take them out gently upon them, and when the box is cleaned, I lay them in, on the ſame leaves, with freſh ones over them, (with the dew on, if I can get them) and the fibre ſide of the leaves up: when they are all on the upper leaves, I remove the old ones; by this method a quantity of ſilk is ſaved, for, from the moment they are hatched, they move themſelves by a ſilken web; the ſilk continually iſſuing from

from their mouths, if they crawl to any diſtance: Therefore I do not approve of the method uſed here, of ſtriking them with a feather off the leaves to which they ſtrongly adhere, as every time that practice is uſed, they not only loſe a quantity of ſilk, but are viſibly in pain, which may be ſeen by their various contortions; by theſe means, and keeping them dirty, they do not rear one tenth part of what they hatch, nor bring them to any ſize, though at the appointed time they will ſpin, but the ſilk is not worth mentioning.

And now for the indications of ſpinning: When they have ſhed the laſt coat, or exuvia, in the aurelia ſtate, it requires great attention to watch them, leſt they deceive you in regard to the ſilk. The firſt indication of their being near ſpinning, is a tranſparency all over them, with a viſible circulation of the blood, or glu-

tinous matter, which I humbly ſuppoſe forms the ſilk, and aſſiſts in ſpinning: This is viſibly ſeen circulating down the middle of the back. The next ſign is, they erect themſelves on their bellies, with their heads in form of a ſphinx, ſometimes ſeeming to play, biting their ſides and ſilken tail, then lying dormant: But the moſt certain criterion is, when they eat from ſide to ſide of the large fibres in a circular form, nibbling the leaves to atoms, and waſting them. At this period, they become of a fleſhy colour, their backs appear very luminous, eſpecially by candle light.

Laſtly, they move themſelves in a circular manner from ſide to ſide of the box; at this moment they are to be put in papers, or all the labour will prove abortive. If you approve it, I ſhall ſend my ſilk for your inſpection.

Since

Since I wrote the foregoing, a Gentleman has been at my office, who lived three years in Italy, he declared though he had ſeen many thouſands ſpin there, he never ſaw finer Worms than mine, and expreſſed his aſtoniſhment at their ſpinning at this ſeaſon.

I am, Sir,

Your much obliged humble ſervant,

A. WILLIAMS.

Mr. MORE.

SIR,

Graveſend, Dec. 5, 1777.

SIR,

I was favoured with your Letter yeſterday, and beg you to return my moſt reſpectful devoirs to your good Society for the honour they have conferred on me, in thanking me for my humble endeavours in regard to thoſe dear little innocent reptiles the Silk Worms. I ſhall ſend my Silk up next week by a friend, under three different claſſes, (viz.) that of my firſt brood, that of my ſecond, and ſome reeled off the eighteenth, nineteenth, and twentieth of November.

I have even at this time, Moths laying eggs, and I dare ſay not leſs than two hundred this evening, while I was looking at them; and I again aver I could breed them and produce Silk worms from them all the Winter, had I a ſpot of ground. Lettuce may be produced all the Winter, ſown on the north borders where the

the Sun comes, and that in the moſt inclement ſeaſons, only by covering them at night with hay or ſtraw, and removing it when the Sun is out, as may Primroſe leaves, and it muſt be a hard winter indeed, when there are no bramble leaves to be got. I am not clear whether I informed you I feed my Worms with the leaves moiſt, as I have not time to take copies of the letters I write, but this I am clear in, they thrive moſt on them when ſo. As to Cocoons, I have none, for after my firſt eſſay of reeling off about a dozen, I obſerved that the ſilk, the nearer it came to the cocoons, grew finer, ſtronger, and better coloured. It immediately occurred why might not the whole cocoon be reeled off.

As I obſerved every minute circumſtance of the Worms ſpinning, from the firſt formation of the woof, and perceived it ſpan from right to left, why might not I by following its paces, obtain all the

Silk

Silk it ſpun: I tried the experiment in water, ſo hot I could ſcarce keep my hand in, and it anſwered my moſt ſanguine wiſhes. The ſtrong glutinous matter, which forms the contexture of the cocoon, immediately gave way, and I reeled off every ſingle thread. It is to be obſerved I only uſed milk warm water, in the firſt proceſs.

The firſt few Cocoons, (about a dozen) I made artificial flowers of, equal in texture to thoſe of Italy; but I thought the real ſilk would be of more value, which is the ſole reaſon of my winding it all off. My chryſaliſſes I put in bran the moment they are wound off, and then watch them every day, until I ſee the place where the moth is to eat out. I then lay them on white paper, where they ſoon make their appearance.

I muſt here obſerve there are more males than females, the reaſon I leave to be determined

termined by judgments ſuperior to mine; but this I know, which is well worth the while of naturaliſts to inveſtigate, that the female aurelia is full of eggs before ſhe changes her ſtate to that of a Chryſalis.

I am, Sir,

with all reſpect,

Your moſt obedient ſervant,

A. WILLIAMS.

Mr. MORE.

Poſt

Poſt Office, Graveſend, Dec. 8, 1777.

SIR,

I believe I forgot to inform you of the experiments I made in regard to the dung of the Silk Worm: I put ſome to ſome Auriculas almoſt exhauſted, inſomuch that there were nothing but their hearts left; in a few days they turned of a vivid green, put forth freſh leaves, and are now in the moſt flouriſhing ſtate; and will, I dare ſay, blow about Chriſtmas. I tried it on various different flowers, annuals as well as others; it anſwered equally the ſame. As to the rapidity of enforcing vegetation, proofs poſitive carry conviction; and, I will venture to affirm there is not an exotic, however delicate, but I could rear with this very dung, provided the ſun ſhone on them.

It may perhaps be objected, the dung muſt be ſo trivial, it can be of no uſe. I aver,

aver, I had from my Worms, near two Gallons of it, and I ſpread it half an inch over the pots, which had every efficacy that could be wiſhed, from the fineſt dung. Another advantage accrues from theſe pretty little creatures, which is the outſide woof, I believe to be the fineſt ſtiptic in the world.

As I was reeling one day, I mentioned my thoughts to a Gentleman who begged leave to look at my reel and method, and who I found to be principal phyſician to a fleet of tranſports going to join Lord Howe; he ſmiled, I told him I was certain it was ſo, and the firſt time I cut myſelf I would try its efficacy: Accordingly next day, in mending a pen, I cut my thumb to the bone, and through part of the nail; it bled profuſely; I tried my Stiptic; bound up the wound; the hemorrhage ſtopped, and the wound healed in three days. Since which I have tried it on ſeveral, and it always had the deſired effect. I really and

ſincerely

ſincerely believe, that half the benefit ariſing from this minute part of the grand Creator's works are not yet unravelled, thoſe which are, ſerve to elucidate the inſcrutable ways of the omnipotent Creator of the univerſe, whoſe works I ſhall ever adore with reverential awe and wonder.

I am, Sir,

Your moſt obedient ſervant,

A. WILLIAMS.

Mr. MORE.

SIR,

SIR,

I received your favour this day, with the agreeable account of your Society voting me Twenty Guineas, for my letters on rearing Silk Worms: Pleaſe, Sir, to return them my dutiful reſpects for the great honour they have conferred on me; an honour ſo conſpicuous to me, that ſhall ever while life exiſts, be returned by every effort a grateful heart can ſuggeſt.

Every inveſtigation in my power, ſhall be tranſmitted from time to time; and it ſhall be my whole ſtudy as far as my buſy and troubleſome ſcene of life will admit, to bring the Silk to perfection.

I am, Sir,

Your very obliged humble ſervant,

Poſt Office, Graveſend,
January 30, 1778.

A. WILLIAMS.

Mr. MORE.

May 3, 1778.

SIR,

I have once more the honour to addreſs you, and with pleaſure inform you, my Nymphs and Swains returned to hail congenial Spring, on the 29th of April: matter of conſternation to all who ſee them. I ſuppoſe had I lived in the times of ſuperſtition, I ſhould have been burned for a Witch; as the weather has been ſo extremely inclement, it certainly muſt have been ſo, for none without occular demonſtration will believe it. They are extremely ſtrong, keep hatching every day, and are uncommonly large. I joke and tell all whom curioſity induces to ſee my little family, they ſhall be as big as bulls and cows. And now, my good Sir, to be ſerious, the immortal honour which your Society have beſtowed on me, calls forth every grateful ſentiment of my heart; and your illuſtrious body may depend nothing ſhall be wanting in me to fling a light on what may be of ſervice to thou-

ſands after death has drawn a veil over my face, and covered me with the dark mantle of the grave. Exulting thought! that my poor endeavours may one day prove beneficial to my Country.

I am, Sir,

Your ever devoted and

grateful humble ſervant,

Mr. More.

A. Williams.

The Thanks of the Society were given to the Honourable Daines Barrington, for the following hiſtorical Account of propagating the Silk Worm, and making Silk in England; and as it is ſo nearly connected with the foregoing Letters, it is preſumed the Reader will be much pleaſed with having the Sentiments of the learned Author on this Subject inſerted in this place.

DEAR SIR,

AS I have lately peruſed Mr. Doſſie's Memoirs of Agriculture, which ſo plainly ſhew the great utility to the Public, reſulting both from the labours and munificence of the Society; perhaps ſome obſervations with regard to a few articles, may not be unintereſting.

Firſt, then, with relation to the encouragement intended to the produce of Silk in England, which hath not as yet indeed ſucceeded,

ſucceeded, but which is certainly a moſt capital object, as it affords employment for women and children.

The Silk Worm ſeems to be originally of Aſia, but not of the moſt ſouthern, or even tropical climates of that part of the Globe*. Both extreme heat and thunder ſtorms, are ſaid to be very prejudicial to this inſect†.

It was firſt introduced into Sicilly and Calabria, in the thirteenth Century; and into France, by Henry IV. who began the trial in Languedoc §; and which anſwered ſo well, that James I. made the ſame laudable attempt in England.

* The greatest quantity of the Chinese Silk is made in the neighbourhood of Nanquin, which is in the 32d degree of N. Latitude.

† Malpighi de Bombyce.

§ Raw Silk is now produced in many of the northern Provinces, particularly the Isle de France.

This King, therefore, iſſued a proclamation in the ſixth year of his reign for the encouragement of planting Mulberries *—holding forth the example of France, and directing it to be read at the quarter ſeſſions. As the introduction of ſuch new Culture, muſt neceſſarily require every ſort of protection for a conſiderable number of years, it is not extraordinary that it ſhould not have been then eſtabliſhed on account of the turbulency in the latter part of James's reign, and the greater troubles in that of his Succeſſor †. The propoſal having therefore not at this time ſucceeded, by no means furniſhes a concluſive proof againſt its practicability; but on the contrary, it is evinced by the before-mentioned proclamation, that both

* See the Harleian Miſcellany, Vol. II. p. 208.

‡ This project, however, was not totally neglected by Charles I., for in 1628, he appointed Walter Lord Aston, to be keeper of the Garden, Mulberry trees, and Silk Worms, near St. James's. See Rymer's Fœd. A.D. 1628.

the

the King and his Privy Council, conceived it might be carried into execution. Aſſuming it therefore, that the attempt is not deſperate, it may be material to point out a few circumſtances which may require attention, ſhould the Society ever think it proper to continue or renew their premiums on this head.

The firſt requiſite is the raiſing a proper number of Mulberry trees, and it is generally ſuppoſed that the leaves of the White Mulberry are better food for the inſect than thoſe of the Red.

Mr. Swinburn, however, who lately travelled through Calabria, informs us, that the *red* Mulberry is there preferred *, becauſe the leaves do not appear till ten days or a fortnight after thoſe of the *white*

* See also Mr. Scot's additional Volumes to Chambers's Dictionary, where it is said that the Persians use the *black* Mulberry. As for the *white*, affording the chief food to Silk Worms in China, it is believed that they have not the *black* Mulberry in China.

Mulberry, which is therefore much more liable to be hurt by the early froſts of the Spring, even in that more ſouthern Climate.

It may not perhaps be inexpedient alſo, that a premium ſhould be given to the perſon who may diſcover what other food may be ſubſtituted inſtead of Mulberry leaves. I take it upon my memory, (though I cannot at preſent refer to my authority) that Lettuce hath anſwered well for this purpoſe: and Mulberry leaves ſhould not be ſolely relied upon, even if they are the beſt food for Silk Worms, becauſe they may be blighted in a bad ſeaſon.

If contrary, however, to the opinion of the Calabrians and Perſians, the White Mulberry ſhould be deemed more proper, I have often been informed that there is a large tree of this kind in the Biſhop of London's garden at Fulham, and which was probably introduced by Biſhop Compton, during the reign of Charles II.

As

As perhaps more Silk is produced in China than in every other part of the Globe, we ſhould as near as may be, conform to their uſages, both in raiſing the proper food, as alſo in breeding this valuable inſect, eſpecially as ſuch uſages have had the ſanction of many centuries.

The chief Mart for the raw material, is in the neighbourhood of Nanquin, which is ſituated in the thirty-ſecond degree of N. latitude. But in that more ſouthern climate, they hatch the inſect in rooms heated by Stoves, and from which particular care is taken to exclude both Mice and Rats. Du Halde * alſo informs us, that when the inſect is very young, it is much diſturbed by the barking of a dog, or crowing of a cock, which inconveniences they will probably experience in moſt parts of England, where there may be attempts to rear the Silk Worm.

I make no doubt that this circumſtance may by many be conſidered as deſerving

* In his History of China.

little

little attention, but the authority of every thing ſtated in Du Halde's compilation, is every day confirmed by late travellers.

That ſuch noiſe may affect, not only tender inſects, but animals of greater age and magnitude, is evident from a fact which I have ſo often heard, that I have ſcarcely any doubts with regard to its being true.

London is chiefly ſupplied with Lobſters, either from the coaſt of Norway or the Orkneys; nor do ſhips ſail from either, till their cargo of theſe fiſh is nearly completed. If in the courſe of the voyage however, the veſſels happen to be near a great gun, when it is fired, the greater part of the Lobſters ſhoot their claws, and a diſh of their lading is ſometimes extorted by the threat of a ſalute.

With regard to the diſcovering a ſuccedaneum for Mulberry leaves, the following circumſtances may perhaps deſerve attention.

The

The field for experiment is a very wide one, and therefore the firſt attempt ſhould be made with trees as nearly ſimilar as poſſible to the Mulberry, both in texture of the leaf, as alſo in the taſte of it.

But we have perhaps a more unerring guide in theſe reſearches than our ſenſes.

Moſt inſects prefer the leaf of ſome particular tree or plant, but not excluſively ſo. If, therefore, the inſects which feed upon the Mulberry in England, are alſo found upon other trees or plants, this will afford the ſtrongeſt preſumption that they reſemble each other in their flavour and nutritive qualities.

From the reaſons which I have here ſuggeſted, I have at leaſt convinced myſelf that the attempt to produce raw Silk in England is by no means deſperate, and to give it the better chance of ſucceeding, the encouragement

encouragement ſhould poſſibly be confined to thoſe counties which are upon the ſouthern coaſt.

I have made ſome obſervations upon other articles in Mr. Doſſie's Memoirs, which however I will not trouble the Society with till I hear that the preſent may be thought intereſting.

Believe me, dear Sir,

Your moſt faithful

humble ſervant,

DAINES BARRINGTON.

To Samuel More, Eſq.

MECHA-

MECHANICKS.

Rewards beſtowed by the Society for Inventions and Improvements in Mechanicks, from the Year 1775, to the Year 1782, inclusive.

1775 * MODEL OF A MACHINE for raiſing Ore, &c. To Mr. John Hulman, FIVE GUINEAS.

* MODEL OF A CAPSTAN. To Mr. John Doſcher, FIVE GUINEAS.

* SWIVEL GUN AND HARPOON improved and preſented to the Society. To Mr. Richard Gibſon of Whitby, THIRTY GUINEAS.

GUN HARPOON, promoting the Uſe of. To Captain John Cheſment, THE SILVER MEDAL.

GUN

1775 GUN HARPOON, promoting the Uſe of. To Captain —— Thew, THE SILVER MEDAL.

GUN HARPOON, promoting the Uſe of. To Captain —— Brinkley, THE SILVER MEDAL.

GUN HARPOON, promoting the Uſe of, To Captain —— Frank, THE SILVER MEDAL.

1776 A WHALE ſtruck by the Gun Harpoon, To Mr. Joſeph Coulſon, ONE GUINEA.

* MODEL OF A MACHINE for fiſhing up Goods from the bottom of the Sea, To Mr. —— Fraſer, TEN GUINEAS.

DIVING BELL improved. To Mr. Charles Spalding, TWENTY GUINEAS.

See the Deſcription illuſtrated by a Plate in the firſt Volume of the Tranſactions, page 236.

1776

1776 * FLOATING LIGHT for preſerving the lives of thoſe who fall overboard at Sea. To Mr. William Shipley, THE SILVER MEDAL.

* FRAME WORK for Umbrellas of a new Conſtruction. To Mr. Mc. Enzie, FIVE GUINEAS.

* MODEL OF A CARRIAGE to turn in a ſhort Angle. To Mr. John Hudſon, TWENTY GUINEAS.

* COACH BRACE of a ſtrong and ſecure Conſtruction. To Mr. Groce, TEN GUINEAS.

1777 GUN HARPOONS, for an account of the Uſe of. To Captain Humphrey Foord, TEN GUINEAS.

This Account will be found in the following pages.

A WHALE taken by means of the Gun Harpoon. To Mr. Robert Catmore, ONE GUINEA.

1777

1777 A WHALE taken by means of the Gun Harpoon. To Mr. John Bruce, ONE GUINEA.

Two WHALES taken by means of the Gun Harpoon. To Mr. William Cankwell, TWO GUINEAS.

A WHALE taken by means of the Gun Harpoon. To Mr. Peter Sadler, ONE GUINEA.

* MOVING FEMALE SCREWS for packing Preſſes. To Mr. George Gilpin, TEN GUINEAS.

* WIRE RINGS for Gun Harpoons. To Mr. Abraham Staghold, TEN GUINEAS.

1778 * MACHINE FOR PRESERVING HAY-RICKS during the Making. To Mr. Richard Toft, THE SILVER MEDAL.

INSTRUMENT FOR TAKING DISTANCES AT ONE STATION. To Mr. W. Green, TEN GUINEAS.

1778 EARLY MECHANICK GENIUS, ſhewn in the conſtructing ſeveral Models and Machines. To Maſter Richard Edgworth, THE SILVER MEDAL.

1779 GUN HARPOON, for an account of the Uſe of. To Captain Humphrey Foord, TEN GUINEAS.

This Account will be found in the following pages.

A WHALE taken by means of the Gun Harpoon. To Mr. John Ellis, TWO GUINEAS.

* MACHINE FOR WINDING THREAD, for the uſe of Shoemakers, &c. To Mr. John Powell, FIVE GUINEAS.

* A METHOD OF PRESERVING SHIPS when driven on Shore by ſtreſs of Weather, as practiſed on board the York Indiaman, exemplified by a Model. To Mr. William Barnard, THE GOLD MEDAL.

1779 * UNIVERSAL STANDARD OF WEIGHTS OR MEASURES, for an attempt to diſcover by the different lengths of two Pendulums, making a different number of Vibrations in the ſame ſpace of Time. To Mr. Thomas Hatton, THIRTY GUINEAS.

See the Account publiſhed in the firſt Volume of the Tranſactions, page 239.

* CHIME CLOCKS, for a new Method of conſtructing. To Mr. Robert Sampſon, TWENTY GUINEAS.

1780 GUN HARPOONS, for an account of the uſe of. To Captain Humphry Foord, TEN GUINEAS, and for ſtriking two Whales, FOUR GUINEAS.

A WHALE, taken by means of the Gun Harpoon. To Mr. Anthony Bentley, TWO GUINEAS.

1780 * VALVE WATER COCK, for the Invention of. To Mr. John Holmes, THE GOLD MEDAL.

* MACHINE FOR SLICING TURNEPS. To Mr. Mathew Kite, SEVEN GUINEAS.

* RAISING DOORS OVER CARPETS, for a method exemplified by a Model. To Mr. John Harriſon, THE SILVER MEDAL.

* CRANKS IN WATER-WORKS, SAW MILLS, &c. for a method of diſcharging. To Mr. John Foulds, THE SILVER MEDAL AND TEN GUINEAS.

ARCHIMEDEAN SCREW, for an Account of. To Mr. Robert Cameron, TEN GUINEAS.

* LOCK, of a ſafe Conſtruction. To Mr. Thomas Cornthwaite, TEN GUINEAS.

1781 * LAND ROLLER, for a Model of, To Mr. Thomas Greenſtreet, TWO GUINEAS.

1782 SINGLE WHEEL CHAISE. To Mr. Richard Ford, THE GOLD MEDAL.

*All thoſe Models and Machines marked with *, are reſerved in the Repoſitory of the Society for the Inſpection of the Publick.*

PAPERS

IN

MECHANICKS.

A ſhort Account of the Invention of the Gun Harpoon, which has been introduced into the Greenland Fiſhery, by means of the Rewards beſtowed by the Society; the Utility of which will be manifeſted by the Facts related in the following Letters.

This Contrivance appeared to the Society ſo likely to promote that uſeful Branch of Commerce, The Greenland Fiſhery, that the Society have already expended thereon no leſs a Sum than two hundred and ſeventy Pounds, excluſive of four Silver Medals, given to the Captains Cheſment, Thew, Brinkley, and Frank, for their Endeavours to promote the Uſe of the Gun Harpoon.

IN the Year 1771, a Perſon, by profeſſion, a Blackſmith, of the name of Abraham Staghold, produced to the Society a model of an Harpoon to be fired from a Swivel Gun, differing in form from any before ſeen; for although ſome contrivances of this ſort had been uſed, yet due attention not having been paid to the conſtruction

ſtruction of them, they had been ſo ſubject to miſs the object they were intended to ſtrike, that they had been univerſally and properly laid aſide. In theſe, the Rope, or Foreganger, whereby they were prevented flying away, was fixed to a Ring paſſing thro' a Hole in the Shank, and placed at ſuch diſtance from the end of the Harpoon, that the Shank might enter a proper depth into the Gun; and thus the Ring, being about the middle of the Harpoon, immediately on its diſcharge from the Gun, the direction, inſtead of being in a line towards the Mark at which it was ſhot, was, by the weight of the Rope, diverted downwards, and the inſtrument conſtantly found ineffectual to the purpoſes intended; whereas in thoſe of Mr. Staghold, the Rope or Foreganger, is made faſt to a Ring which traverſes in a Mortiſe along the Shank of the Harpoon (which Mortiſe is of ſuch a length as to admit its being thruſt a proper depth into the Gun) and being ſtopped by the Butt at the End,

follows

follows the Harpoon nearly in a ſtraight line, and has very little tendency to change the direction of it.

This eaſy and ſimple alteration, attracted the notice of every one, and as the Whale Fiſhery is an Object of vaſt importance to theſe Kingdoms, the Society after conſulting many experienced Captains in the Greenland trade, were at the expenſe of furniſhing ſeveral ſhips with Harpoons and Guns; yet from that diſlike to innovations, which ſo much prevails among certain claſſes of men, ſuch attention has not been paid, by the Harpooners in general, to this contrivance as it ſeems to merit; but the following papers will ſerve to ſhew both the regard the Society have had to promoting the uſe of it, and the ſucceſs which has hitherto followed their endeavours to eſtabliſh it, and which will appear of great conſequence, when it is conſidered, that moſt of the Fiſh taken by means thereof, would have eſcaped had the boats been ſupplied with Hand Harpoons only.

Expla-

Explanation of the Print of Gun Harpoons.

A. The Gun Harpoon as originally contrived, in which the Ring, having the Rope or Foreganger, faſtened to it, paſſed thro' a hole in the ſhank, and at the diſcharge of the Harpoon from the Gun, the weight of the rope had an immediate tendency to vary the direction of the Harpoon, and has occaſioned its being entirely laid aſide.

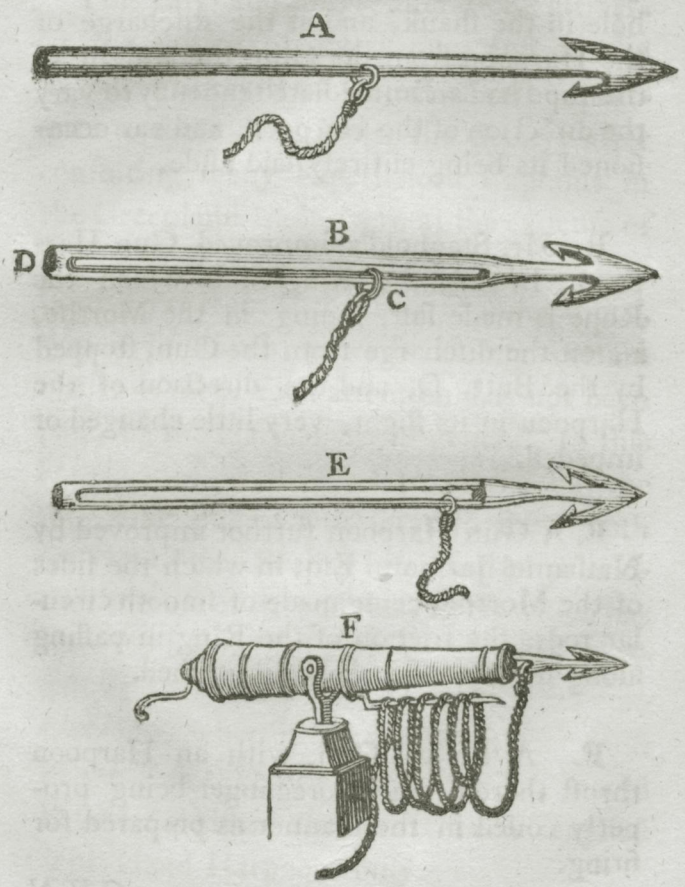
B. Mr. Staghold's improved Gun Harpoon; In this, the Ring C, to which the Rope is made faſt, ſliding in the Mortiſe, is, on the diſcharge from the Gun, ſtopped by the Butt, D, and the direction of the Harpoon in its flight, very little changed or impeded.

E. A Gun Harpoon further improved by Nathaniel Jarman, Eſq; in which the ſides of the Mortiſe, being made of ſmooth circular rods, the friction of the Ring in paſſing along it, is conſiderably diminiſhed.

F. A Swivel Gun, with an Harpoon thruſt therein, the Foreganger being properly coiled in the manner as prepared for firing.

GUN

GUN HARPOONS.



In the Year 1775, *Twenty Pounds, being the Premium offered for taking Whales by Means of the Gun Harpoon, was adjudged to Captain Humphrey Foord, of the Ship Manchester, of Hull, in conſequence of the following Letter.*

SIR,

I Hope you will be pleaſed to excuſe the freedom I take in troubling you with this, the purport of which is, to beg that you will inform the Society of Arts, &c. that laſt year, at Greenland, I ſhot three Whale Fiſh with the Gun Harpoons of their inventing, two of which Fiſh I got; the other was loſt after running out two thouſand two hundred fathom of line, occaſioned by the Wetters, or Feathers of the Harpoon, giving way and bending. And this year, at Greenland, I ſhot two Whale Fiſh, and one Fin Fiſh; one of the Whale Fiſh I got, the other I loſt, as alſo the

the Fin Fiſh; owing to our being at too great a diſtance from them when we fired. I very much approve of theſe Harpoons, but am of opinion they might be improved. Firſt, I think the Gun Locks ſhould be larger and ſtronger; for they are too ſmall, conſequently too weak; apt to miſs fire, and often break. Likewiſe the Wetters or Feathers of theſe Harpoons, are far too weak; they ſhould be ſtronger, and made ſo as to ſtand perpendicular, when placed in the Gun, with the Ring downwards: When they are made to ſtand ſo, they go into the Fiſh in the ſame direction that the Harpooners ſtrike their Harpoons, that is, fore and aft, or with one Wetter towards the Fiſh's head, the other towards her tail; but the Wetters of theſe Harpoons, when placed in the Gun with the Ring downwards, lie in a horizontal form, conſequently will go into the Fiſh with the Wetters right acroſs her Back, and will never hold, unleſs they be drove in a long way,

way, even quite through the Blubber and into the body of the Fiſh, and then it is uncertain whether they will hold or not; and it is owing entirely to their entering in that direction, that the complaint, ſo often made againſt them, by thoſe who uſe them, ariſes, that they do not hold, but come out again immediately, although they are drove a long way into the Fiſh; this I ſpeak from experience, having got ſome Harpoons made here with the beards to ſtand in perpendicular form, when placed in the Gun as above, which never yet deceived me.

In order to be a little more explicit in the above, you will pleaſe to obſerve, that no Fiſh will ever allow a Boat to come within twenty fathoms of her, when on her eye, that is, when the Boat comes towards her broadſide; if ſhe would, then the London made Harpoon would enter in a proper direction; but the Boat muſt be

be right behind, or right before the Fiſh, or they will not allow us to come ſo near them as to get faſt, either with the Hand or Gun Harpoon.

The Harpoon was buried above ſeven feet in the firſt Fiſh I ſhot laſt year, but I was very nigh when I fired. One may get faſt, ſo as to do execution, about fifteen fathom from the Fiſh, but not more, unleſs our lines were ſmaller and lighter; and I am of opinion, if one had about thirty fathom line, made of ſilk, to bear the ſame ſtrain that our Whale Lines do, it would be ſmaller and lighter than our Whale lines are, as I ſuppoſe ſilk is ſtronger than hemp: In that caſe, I make no doubt but one might get well faſt twenty-five fathoms diſtance from the Fiſh, but ſhall leave that to the Society's conſideration and ſuperior judgment.

I would have wrote to them laſt year, but not knowing how to direct, was the cauſe

cauſe of my ſilence. I am informed they have offered a premium to any one who ſhoots a Whale Fiſh, if ſo, I hope they will adjudge me entitled to it. If you pleaſe to favour me with a line, acknowledging the receipt of this, you may direct to me in Hull, Yorkſhire. I hope you will overlook the blunders of an illiterate Tar, who is unacquainted with writing to the Great; in ſo doing you will oblige,

Sir,

Your moſt humble ſervant,

HUMPHREY FOORD,
Commander of the
Ship Mancheſter.

Hull, Sept. 2,
1775.

Mr. MORE.

Gentle-

Gentlemen,

I and my Ship's Company having been pretty fortunate in killing Whales with the Gun Harpoons, for theſe two laſt ſeaſons at Greenland; I am induced to ſend the following true and authentick account of our ſucceſs, viz. On the 18th of May, 1774, I ſhot or ſtruck a Fiſh with the Gun Harpoon, which we killed in fifty minutes; the Harpoon was drove above ſeven feet into her, but I was not above ſix fathom diſtant from her when I fired. She was ten feet eight inches bone, and filled forty-five butts of Blubber.

Alſo on the 20th of May, 1774, Peter Sadler, one of my harpooners, ſhot another Fiſh with the Gun Harpoon, which we killed in two hours; the Harpoon was hanging by one feather or beard, but it had been drove four feet into her; when he fired, he was about fifteen fathoms diſtant

diſtant from her; ſhe was twelve feet bone, and filled ſeventy-five butts of Blubber.

Likewiſe on the 31ſt of May, 1774, I ſhot another Fiſh with the Gun Harpoon, which ran me out two thouſand two hundred Fathom of line, and after being five hours faſt, we loſt her, owing to one of the beards of the Harpoon giving way and bending. I was about ten fathoms diſtant from her when I fired, and was well faſt, as the Harpoon had been drove about five foot into her, when firſt ſtruck. Two days after that, we broke our Gun Lock, and not having another, we had no more opportunity of uſing the Gun Harpoons that ſeaſon.

On the 17th of May, 1775, Joſeph Coulſon, one of my Harpooners, ſhot a Fiſh with the Gun Harpoon, which we killed in half an hour: The Harpoon was

drove about three feet into her; he was about twelve fathom diſtant from her when he fired, ſhe being then juſt below the ſurface of the water. Likewiſe, the ſaid Joſeph Coulſon, ſhot another Fiſh with the Gun Harpoon, on the 26th of June, 1775, which ran him out one hundred and twenty fathom of line, when the harpoon drew, occaſioned by his being at too great a diſtance from her when he fired, ſhe being then above twenty fathom diſtant from the boat.

I have ſent a Gun Harpoon to the Society for promoting Arts, Manufactures, and Commerce; it is the ſame weight, ſize and conſtruction, as thoſe I have always uſed at Greenland with ſucceſs. My method is to put a piece of Cork in the Breach of the Harpoon, to prevent the Ring and Harpoon from hurting each other.

When

When the froſt is very intenſe, I ſcarce put in one ounce and quarter of powder, but in ſoft weather, I put in near one ounce and an half.

I am, Gentlemen,

Your moſt humble ſervant,

Hull, Nov. 8, 1775.

HUMPHREY FOORD.

To the Society for the Encouragement of Arts, &c.

In the Year 1778, *In conſequence of the following Letters, Ten Guineas, being the Premium offered for the moſt ſatisfactory Account of the taking Whales by the Gun Harpoon, were adjudged to Captain Humphrey Foord of the Mancheſter Greenlandman; One Guinea to John Bruce; Two Guineas to William Cankwell, and One Guinea to Peter Sadler, Harpooners aboard the ſame Ship, for having ſtruck Whales with the Gun Harpoon, which Whales were afterwards taken.*

SIR,

Pleaſe to inform the honourable Society for the Encouragement of Arts, Manufactures, and Commerce, that this year at Greenland, on the 24th of May, Anthony Bently, one of my Harpooners, ſhot a Fiſh with the Gun Harpoon, which ran out one hundred and twenty fathom of line, when

when it ran foul of the boats ſtem and broke the Harpoon, ſo we loſt her. He was about ſeven fathom diſtant from her when he fired, and was well faſt, as the Harpoon had been drove about five feet into her. Alſo on the 28th of May, William Cankwell, another of my Harpooners, ſhot another fiſh, which ran out two hundred and fifty fathom of line, and died before any of the ſhip's boats got to her; he was between ſix and ſeven fathom diſtant from her when he fired; the Harpoon was hooked to one of her ribs, and brought out a piece of her lights, along with it. Likewiſe on May the 30th, Peter Sadler, another of my Harpooners, ſhot the ſecond Harpoon into a Fiſh, and got well faſt; he was about thirteen fathom diſtant when he fired; immediately after he got faſt, the firſt Harpoon drew; we killed her in half an hour after he (I mean Sadler) got faſt; if it had not been for the Gun Harpoon, we ſhould have loſt her, as

ſhe lay in a hole of the Ice, ſo that it was not poſſible to get at her with the Hand Harpoon. On the 15th of June, John Bruce, my chief mate, ſhot another Fiſh, which run out eight hundred fathom of line, and was almoſt dead when the boats got to her; we killed her in three quarters of an hour; the Harpoon was drove right into her guts, ſome of which it brought out along with it. He was five or ſix fathom diſtant from her when he fired.

On the 22d of June, the abovementioned William Cankwell, ſhot another Fiſh, which run out about four hundred fathom of line, the Harpoon went in at the back part of her head, and grazed againſt her ſkull, which we ſuppoſed it had fractured, for ſhe was three quarters of an hour ere ſhe came above water, and was quite ſtupid, and almoſt dead, when the other boats got to her; we killed her in an hour; he

he was about ten fathom diſtant from her when he fired.

Pleaſe to obſerve that I cannot be very exact to the diſtance they were from the Fiſh when they fired, but there was none of the above Fiſh ſo nigh the boat, as to get faſt with the Hand Harpoon, for I have two Harpooners in each boat, one to fire and the other to ſtrike at the ſame time, with ſtrict orders not to fire until they be within ſtrike of the Hand Harpoon, (provided the Fiſh lies) for fear the Gun ſhould miſs fire, which is too often the caſe, and is partly owing to the ſmallneſs of the Gun Locks. The Fiſh that Cankwell ſhot firſt, and the Fiſh that Bruce ſhot, the Harpooners hove each of them with the Hand Harpoons, but could not reach either of them.

I have condemned the Rings that are faſt to the Harpoons, for when the froſt was very intenſe, they often broke, and deceived me; I reave the Foreganger through the

the Harpoon, and make an Eye ſplice, which traverſes in the Harpoon, the ſame as the Ring did, and anſwers the end ſo well that we have not loſt a Fiſh this ſeaſon, that we have got faſt to, excepting the one that Bently ſhot, and that was owing to the line running foul, for the Harpoon held till it broke. My Harpooners ſhot at ſeveral other Fiſh this ſeaſon, moſt of which were at too great a diſtance from them, and ſome they miſſed, we have likewiſe loſt four or five very good chances, occaſioned by the Guns miſſing fire; if a remedy was found to prevent them from miſſing fire, I ſhould not be afraid of filling my ſhip every year, provided I got well in among the Ice, into ſmooth water, for we can do nothing with the Guns when there is any ſwell or wind lipper.

I am informed there are braſs guns, to be had at London, that do not weigh above fifty pounds, which will admit a Harpoon of

of the ſize that we uſe; I ſhould like to have one of them, as the Guns that we make uſe of are ſo heavy, they prevent the boatſmen greatly from rowing,

I am, Sir,

Your humble ſervant,

Hull, Auguſt 4, 1777.

Mr. More.

Humphrey Foord.

SIR,

Hull, Jan. 30, 1778.

SIR,

Laſt Poſt I was favoured with yours of the 22d Inſtant, informing me that ten guineas, being the premium offered, was adjudged to me by the Honourable Society for the Encouragement of Arts, Manufactures and Commerce, for which favour I do hereby return them my moſt ſincere thanks. You likewiſe tell me, Bruce, Sadler, and Cankwell, are to have four guineas, which they have authorized me to receive for them. The Wire Rings, as deſcribed in your advertiſement, may be of great ſervice to thoſe who uſe the Whitby Gun Harpoons, as they are ſo ſmall they will not admit a Whale line to traverſe in them, but as for the Harpoons that I uſe, experience ſhews me, that no Ring whatever can anſwer the end better than the line does, when reeved in the Harpoon as deſcribed in my laſt letter to you. If any thing occurs

curs during the enſuing voyage to Greenland, that I think may be worth your notice, I ſhall take the freedom to communicate it to you on my arrival from thence; till then I remain.

I am, Sir,

Your very humble Servant,

Mr. More.

Humphrey Foord.

In

In the Year 1779, *Ten Guineas, being the Premium offered for an Account of the taking Whales by the Gun Harpoon, was adjudged to Captain Humphrey Foord of the Mancheſter Greenlandman; and alſo Four Guineas to him, for having ſhot two Whales; and Two Guineas to John Ellis, Harpooner, he having ſhot one Whale in the Year* 1778, *as appears by the following Letter.*

SIR,

Pleaſe to inform the honourable Society for the Encouragement of Arts, Manufactures, and Commerce, that on the 7th of May laſt, John Ellis, one of my Harpooners, ſhot a Fiſh with the Gun Harpoon, which we killed in three quarters of an hour; he was about ten fathom diſtant from her when he fired.

And on the 31ſt of May, I ſhot two Fiſh with the Gun Harpoon; the firſt I fired

fired at juſt as ſhe hove up her tail to go down, and got faſt to her rump, which ſpoiled her ſteerage ſo much that ſhe could not run, but ſunk perpendicular down about eight hundred fathom, and there died. When we hauled her up, the Harpoon was ſhot quite through her rump. The ſecond I ſhot, the Harpoon went in a little abaft the fin, and lodged in her body, which killed her ere any of the other boats got to our aſſiſtance: I was about ſix or ſeven fathoms diſtant from her when I fired, and about nine fathom from the firſt.

I ſtill fixed the line to the Harpoon, as deſcribed in my letter to you laſt year, with the addition of what I call a Snap Gammet, which Gammet is made of rattlin line, traverſes in the Harpoon, next the breech, and is ſized to the line about two feet from the end or nooſe, with about eight turns of Whale line yarn; which Gammet or ſizeing, puts the line in motion,

tion, and breaks, but does not hurt the line, and it prevents the nooſe or eye, on the end of the line, from receiving any damage. It anſwers the end ſo well that we have never loſt a Fiſh that we got faſt to, ſince I condemned the Iron Rings. As for the Wire Rings, I never uſed any of them, but was in company, this year, on the 2d of May, with Captain Hurd, commander of the Leeds Induſtry, of this place, when his mate ſhot a Fiſh with one of the Whitby Gun Harpoons, with a Wire Ring; the Ring ſtood the ſhock very well, but after running out four hundred fathom of line, and holding a pretty good ſtrain, the Wire Ring broke, and loſt them a very large Fiſh; the Ring came up with the line, and was cut through with the Breech of the Harpoon, and appeared the ſame as if cut with a cold Chiſſel. This I ſaw.

The greateſt diſadvantage we labour under, which prevents the Gun Harpoon from

from being one of the nobleſt contrivances that ever was invented for killing Whales, is, the want of experienced perſons to fire the Guns; as for the Harpooners, they are like a parcel of old Gin Horſes, that cannot be drove out of their pace; and notwithſtanding all the encouragement they have met with from the Society of Arts, Manufactures, and Commerce, yet there is not one in ten of them that will uſe the Gun Harpoon, unleſs compelled, and then they make ſo many blunders, that it puts a man out of all patience to ſee them; for which reaſon, I have unſhipped ſeveral of them, and amongſt others, two this laſt ſeaſon on that account.

My bad ſtate of health for theſe two laſt years, makes me unable to go into the boats myſelf, nor have I been in a boat during that period, excepting the day I ſhot theſe two Fiſh. If I was capable of going in the boats, I ſhould not be afraid but that I

ſhould get my ſhip as full every year as ſhe was this laſt.

Pleaſe to acknowledge the receipt of this, by a line to me, when convenient; in ſo doing, you will oblige,

SIR,

Your humble ſervant,

Hull, Octr. 31, 1778.

Mr. MORE.

HUMPHREY FOORD.

In

In the Year 1780, *Premiums of Fourteen Guineas, were adjudged to Captain Humphrey Foord,—and a Premium of Two Guineas, to Anthony Bently, Harpooner, for the following Account, and for taking three Whales in the Year* 1779.

SIR,

Pleaſe to inform the honourable Society for the Encouragement of Arts, Manufactures, and Commerce, that on the 9th of June, this year, at Greenland, Anthony Bently, one of my Harpooners, ſhot a Fiſh with the Gun Harpoon, which we killed in three quarters of an hour; he was about ten or eleven fathom diſtant from her when he fired. The ſame day he fired at two more Fiſh, one he miſſed, the other the Harpoon did not reach, ſhe being at too great a diſtance.

Alſo on the 21ſt of June, Jonathan Bailey, another of my harpooners, ſhot a Fiſh, and got well faſt, but after running out about two hundred fathom of line, the Harpoon drew, occaſioned by his holding too much ſtrain, ſo we loſt her; he was about fifteen fathom diſtant from her when he fired: the Harpoon had been drove about two feet into her.

The ſame day I ſhot the ſecond Harpoon into a Fiſh; I was within two fathom of her when I fired; the Harpoon went in between her Fins as ſhe was rolling over, and was drove ten feet into her: ſhe ſunk perpendicular down about one hundred and twenty fathom, and died immediately. It was with a good deal of difficulty we got the Harpoon extracted out of her.

On the 23d of June, Edmund Smith, another of my Harpooners, ſhot a Fiſh, which ran out about three hundred Fathom

thom of line, when the Harpoon drew, ſo loſt her; he was about ſeventeen fathom diſtant from her when he fired: The Harpoon had been drove about a foot into her, but went in on the flat, that is, with the Beards acroſs the Fiſh's back, which was the reaſon it did not hold; I ſuppoſe that the line had canted the Harpoon in going ſuch a diſtance, as he was right behind the Fiſh when he fired.

The reaſon that I made ſo little uſe of the Gun Harpoon this ſeaſon was, that I made my fiſhery between the Land and the Ice, in clear water, where there was a deal of ſea and wind lipper. In ſuch a ſituation we can make little or no uſe of the Gun Harpoon, the boats having too much motion.

I ſtill continue to fix the line to the Harpoon, as deſcribed in my letter to you laſt year. This year I fired one of my Gun Harpoons ſeven times with the ſame line

to it, and there was not a ſingle yarn of the line broke, either at the nooſe that is reeved through the Harpoon, nor at the ſizing where the Snap Gammet is fixt, where the line is firſt put in motion, nor any where elſe; but the Gammet broke every time as deſigned, ſo I fixed a new Gammet at every firing.

I am Sir,

Your moſt humble ſervant,

Mr. MORE.

HUMPHREY FOORD.

Hull, Nov. 9, 1779.

P. S. I am juſt now getting made a Gun Harpoon, on the ſame conſtruction of thoſe I uſed laſt year, with this difference only, that it is to have three beards all of an equal ſize; if it ſhould anſwer upon trial, ſhall adviſe you of it on my return from Greenland.

The Society never received the Information here promiſed, reſpecting the three-bearded Harpoon, but a Patent has ſince been obtained for them.

In

In the Year 1778, *The Silver Medal was given to Mr. Richard Toft of Kentiſh Town, Middleſex, for his ingenious Contrivance to ſecure Hay-Ricks from Rain, during the Making; of which a Model is kept in the Society's Repoſitory, and the Deſcription follows as drawn up by Mr. Toft in his Letter on this Subject.*

SIR,

THE ill effects of a wet Hay ſeaſon, in the neighbourhood of London, the laſt year, having been ſeverely felt, together with the favourable eye the Society for the Encouragement of Arts, Manufactures, and Commerce, regard every attempt to accommodate the Public, have thus induced me to offer them a model of my temporary Barn for the ſecurity of Hay-Ricks, while making from the Rain. It is applicable in a few minutes in caſes of ſudden ſhowers, and is an effectual covering that will reſiſt

the moſt violent rain for any length of time. It is with little trouble removed, and thus applicable to twenty Ricks, if you pleaſe, in one ſeaſon. Perhaps ſome may object to the expenſe, to which I can truly anſwer, from ſeven years' experience, that it will in many inſtances, ſave that expenſe, by preventing the ill effects of a ſudden ſhower, and that with care, it will laſt many years.

The pedeſtals are ſuppoſed to be four feet in the ground, and it will be neceſſary to have four of them, that as two are in uſe, two others may be ſet at another bottom, in readineſs to receive the poles. The model is upon the ſcale of half an inch to a foot, and is calculated for a bottom of thirty feet in length, and twenty-one to twenty-four wide. The cloth is required to be wider than long, as it is to be raiſed by the ridge pole, to admit the air, and a free perſpiration to the hay; and becauſe Ricks are generally wider in the middle than

than they are at the bottom, it is divided into two for the greater eaſe in reefing or folding over the pole; in order to which, it is to be covered until it reſts entirely upon the Rick, and then to be hoiſted above the heads of thoſe at work.

When a Rick is advanced above the Eaves, and begins to narrow, the cloth may be taken down, which may be eaſily effected by unhooking the ridge pole at one end, and letting that down by a rope; then unhook and let down the other in like manner. If it is to be removed to any conſiderable diſtance, it muſt be carefully reefed upon the pole, and a rope laſhed round it: there is no harm in the cloth when ſpread, reſting upon the ſides of the Rick; but in caſes of very high winds, it will be neceſſary to ſecure it with ropes; and alſo the upright poles, as they are in the model, to the corner of the baſe; for although they have, in calm weather, ſufficient

ficient power for their purpoſe, by this ſlight addition, you will be ſecure againſt all events.

I am, Sir,

Your moſt obedient

humble ſervant,

Mr. MORE.

RICHARD TOFT.

Kentiſh Town,
April 14, 1778.

Eſtimate

Eſtimate of the Expenſe of Mr. Toft's Machine for ſecuring Hay Ricks during the making.

	£.	s.	d.
240 yards of Duck prepared with tar and oil, and making ditto at 1s. 8d. per yard -	20	0	0
Three ſcaffold poles -	1	2	6
Two of theſe to be upright, the other for a ridge to be made thickeſt in the middle, in manner of a ſhip's yard.			
Workmanſhip with pullies to the ſame - -	1	1	0
Two double blocks - -	0	15	0
1 cwt. of tarr'd rope, about	2	5	0
Four pedeſtals - -	2	0	0
A reel or windlas - -	1	0	0
Iron work, &c. - -	0	5	0
	£ 28	8	6

COLONIES AND TRADE.

Rewards beſtowed by the Society for the advantage of the Britiſh Colonies, from the Year 1775, *to* 1782, *incluſive.*

1775 SILK FROM WORMS RAISED IN MINORCA. To Mr. Joſeph Soler, Two ſhillings and ſixpence for each pound. TWO POUNDS FIFTEEN SHILLINGS.

ZEBRA WOOD, for importing. To John Pitt, Eſq; THE GOLD MEDAL.

EARTH NUTS AND SESSAMUM SEED, for importing and preſenting to the Society for Experiment. To Mr. Samuel Bowen, THE GOLD MEDAL.

ZEBRA

1776 ZEBRA WOOD, for importing. To George Hewm, Eſq; THE GOLD MEDAL.

1778 AMERICAN COTTON, for an account of the beſt kinds, To Mr. Andrew Bennet, THE GOLD MEDAL.

See his Paper on this Subject, in the firſt Volume of the Tranſactions, page 254.

INDIGO, for producing the beſt, with an account of the proceſs made uſe of in preparing it, which account is now firſt printed. To John Robley, Eſq; THE GOLD MEDAL.

PAPERS

IN

COLONIES AND TRADE.

1778. *The Gold Medal of the Society was adjudged to John Robley, Eſq; for the beſt Indigo imported by him from the Iſland of Tobago.*

King Street, London, Jan. 30, 1778.

SIR,

THE Iſland of Tobago having the misfortune to be infeſted with the Ants, many proprietors of eſtates have been obliged to abandon the culture of ſugar, amongſt whom were my brothers and myſelf, after being at above twenty thouſand pounds expenſe, in erecting ſugar works, mills, &c.

Having rooted out every cane, we planted Cotton, Indigo, and Turmerick, all of which we hope to bring to ſome tolerable perfection. Laſt year we made about eighty thouſand pounds weight of fine Cotton, and upwards of ten thouſand pounds weight of

good Indigo, and hope this year to make more; as likewiſe to have ſome hundred weights of Turmerick equal to any brought from the Eaſt Indies.

My Indigo having ſold at ſeven ſhillings and tenpence, and ten ſhillings the pound, and being informed by the perſons who bought it, (Meſſrs. Coney and Wilſon) that it is equal, if not ſuperior, to any quantity that has yet come from his Majeſty's Plantations;

I take the liberty of troubling you with a ſample of four pounds, the certificate, &c. with a plain account of the proceſs, which you will pleaſe to lay before the Society.

I am, Sir,

Your moſt obedient humble ſervant,

JOHN ROBLEY.

To Mr. MORE.

THE

THE Sample of Indigo ſent, was produced from Plants raiſed from Seed, ſown on a Plantation at Tobago, in September 1776, in rows* at about fourteen inches diſtant, on good ground, well tilled by hand hoeing, and kept well weeded. When the Plants were about ſix weeks old, they were cut, early in the morning, with the dew upon them, put into a ſtone ciſtern, well terraſſed, ſtrewed very light, then filled with ſoft river water, and covered over with boards well ſecured down. After fermenting about twelve hours, the liquor was let off into another ſtone ciſtern, and churned about two hours, throwing in a ſmall quantity of Oil to *fall* the froth occaſioned by the churning. After being properly ſettled, the thin water is let off, and the ſediment or Indigo, taken out and put into a frame lined with coarſe

* The French and Spaniards ſow their Indigo Seed in the broad-caſt way, like garden ſeeds, which makes it very difficult to weed and keep clean.

linen * ſet over a bed of ſand to extract the water, and afterwards put into another ſmall frame lined with linen, and preſſed to get out all the moiſture.

The Indigo being then a very ſtiff paſte, is cut into ſquare pieces, and put on boards to dry in the ſhade, turning the pieces ſeveral times over, till thoroughly dry and fit to pack in caſks or boxes.

N. B. Great care is required at the time of fermenting and churning.

* The French and Spaniards, to get the water from the Indigo, put it into small bags like a jelly bag; this occasions the water to be a long time running off, and makes the curing very tedious and very offensive to the persons who attend it; hence it is, that the manufacturing Indigo has obtained the character of being unwholesome.

AN

ABSTRACT

OF THE

PROCEEDINGS

OF THE

SOCIETY

In the YEAR MDCCLXXXIII.

AGRICULTURE.

THE Society having ſeveral years offered a premium for an account of the utility of the Wood of the Larch Tree,

the ſaid premium of Thirty Pounds, was this year adjudged to Mr. Joſeph Cowliſhaw, junior, of Hodſock Park, Nottinghamſhire; from whom ſeveral certificates were received, declaring the Utility of this kind of Wood, in Spars, Rails, Gate-bars, Floor boards, &c. by which it appears, that this Wood is very durable, and of great uſe for all thoſe purpoſes. That much of it has been worked in the neighbourhood of Workſop, where the people are fond of purchaſing ſizeable trees for building.

In the woods planted by the late duke of Norfolk, are many Larches; ſome of them have been growing upwards of forty years, and are now fine ſtraight flouriſhing trees, ſquaring ſeven and eight inches, at the length of twenty-five, thirty, and thirty-five feet. And in a letter from Mr. Wake, ſteward to the duke of Norfolk, on this ſubject, is the following paſſage, "On "the

" the whole, I am of opinion, Larch " Timber is likely to be of great public " utility, and that it is laudable in the " Society to pay proper attention to its " cultivation."

The ſpecimens produced in order to ſhew the durability of this Wood when expoſed to the weather, are reſerved in the Society's repoſitory, for the inſpection of the Publick.

THE Thanks of the Society were given to Mr. Boys, of Betſhanger, near Sandwich, in Kent, for having communicated to them his obſervations on the culture of different ſorts of Wheat, (which will be publiſhed in a future Volume of the Tranſactions) and Models of the Ploughs mentioned in his letter, were purchaſed by the Society, and preſerved in their repoſitory.

THE Thanks of the Society were given to Mr. Tugwell, of Beverſtone, for his addi-

tional obſervation on the culture and application of the Turnep-rooted Cabbage. See his letter on this ſubject inſerted in this Volume, page 94.

IN the Claſs of Chemiſtry, no matters have this year been produced to the Society which have been judged deſerving the attention of the Publick.

POLITE AND LIBERAL ARTS.

THE obtaining accurate Maps of the ſeveral Counties of England, has ever been deemed worthy the attentive conſideration of the Society, and large premiums were formerly offered and paid for actual ſurveys of Derbyſhire, Dorſetſhire, Devonſhire, Northumberland, Leiceſterſhire, &c. but ſuch premiums have, during ſome years paſt,

paſt, been diſcontinued; notwithſtanding which, it has been cuſtomary on every occaſion, to encourage thoſe works, by honorary marks of the Society's approbation; and a correct Survey of Somerſetſhire, having been this year produced to them, The Society, after duly conſulting many Gentlemen of the County, and being fully informed of the truth of the bearings, diſtances of places, &c. voted their Silver Medal and Twenty Guineas, to Mr. William Day, who made the Survey; and as a mark of their approbation of the care and fidelity of Mr. C. H. Maſters, who aſſiſted Mr. Day in the work, The Society alſo voted to him, their greater Silver Pallet, with a ſuitable inſcription.

IT has been already obſerved, Vol. I. p. 48. That ſince the eſtabliſhment of the Royal Academy, the Society have chiefly confined their Rewards in this Claſs, to ſuch of the nobility and gentry, as apply to

to the practice of the fine Arts, or to young perſons who are intended hereafter to become Artiſts. And in proſecution of this plan, the following Premiums and Bounties have been this year beſtowed on ſuch Candidates as have been judged moſt deſerving encouragement; it muſt however be underſtood, that among the Candidates, particularly for the honorary premiums, many more performances of great merit were produced than it was in the power of the Society to reward.

THE following Liſt contains the names of thoſe perſons to whom Rewards have been adjudged in the Claſs of Polite Arts, in the year 1783.

Claſs 123. HONORARY PREMIUMS. To the Hon. Miſs CAROLINE WALPOLE, Spring Gardens, for a Drawing, THE GOLD MEDAL.

Claſs

Claſs 127. HONORARY PREMIUMS. To MISS MARY CUNLIFFE, New Norfolk Street, Groſvenor Square, for a Drawing, THE GOLD MEDAL.

Claſs 128. HONORARY PREMIUMS. To MISS ELIZABETH SMITH, Great George Street, Weſtminſter, for a Drawing, THE SILVER MEDAL.

Claſs 143. HISTORICAL DRAWINGS. To Mr. CONRAD MARTIN METZ, No. 7, Kirby Street, Hatton Garden, THE GOLD PALLET.

Claſs 144. HISTORICAL DRAWINGS. To Mr. HENRY WEBBER, Etruria, near Newcaſtle, Staffordſhire, THE GREATER SILVER PALLET.

Claſs

Claſs 133. MODELLING FROM THE LIFE. To Mr. CHARLES PEART, Charlotte Street, Portland Place, a SILVER MEDALLION, given in Conformity to the Will of John Stock, of Hampſtead, Eſq.

Claſs 134. DRAWINGS OF OUTLINES. To Miſs CATHERINE CHARLOTTE RAPER, Chelſea, THE GREATER SILVER PALLET.

To Miſs CATHERINE BLACKWOOD, Somerſet Street, Portman Square, for a Drawing, THE GREATER SILVER PALLET.

IN the Claſs of Manufactures, ſome matters have been this year produced to the Society, but the merits of them being not fully aſcertained, the account of them muſt be poſtponed to a future Volume.

MECHA-

MECHANICKS.

A LOCK, invented by Mr. Cornthwaite, of Kendal, on a ſecure and ſafe principle, was produced to the Society, and the Silver Medal and Five Guineas, were voted to him for the invention.

This Lock, with another by the ſame perſon, are preſerved in the Society's repoſitory, for the inſpection of the Publick.

A SCAPEMENT, for the uſe of Clockmakers, which, in the opinion of ſeveral perſons of that profeſſion, and others well verſed in Mechanicks, is very ingenious, and may be advantageouſly applied to machines for meaſuring time, invented by Mr. Matthew Hill, of Scarborough, was produced,

produced, and Twenty Guineas given to him for the ſame.

Mr. Hill is by buſineſs a Hatter, but having a particular attention to Mechanicks, formerly received a bounty of Fifty Pounds, for a Single Wheel Clock of a very ingenious Conſtruction, invented by him; which Clock, with his Machine for weighing Gold Coin, and his Scapement, are preſerved in the Society's repoſitory, for the inſpection of the Publick.

A DIAGONAL SPRING SADDLE, invented by Mr. Edward Dunn of Mount-Street, Berkely Square, was produced to the Society, and the Silver Medal voted to Mr. Dunn for it. This Saddle on examination, and from the evidence of ſeveral who have uſed it, as well as from the opinion of many Sadlers, who were conſulted on the ſubject, promiſes to anſwer the purpoſes for which Spring Saddles have been contrived, better than any hitherto in uſe.

A Saddle

A Saddle of this Conſtruction, is preſerved in the Society's repoſitory, for the inſpection of the Publick.

IN the Claſs of Colonies and Trade, no matters have this year been produced to the Society which have been judged deſerving the attention of the Publick.

MISCELLANEOUS

MISCELLANEOUS ARTICLES.

Under the following Head of Miſcellaneous Articles, thoſe Matters are arranged, for which the Society have returned their Thanks, but which are not properly reducible to any of the foregoing Claſſes.

THE Thanks of the Society were ordered to the Honourable Daines Barrington, for a paper by him laid before them on the culture of Tobacco.

In this paper, Mr. Barrington gave ſome hiſtory of the Plant, with extracts of thoſe acts which relate to the prohibiting the growth of Tobacco in England, and concludes with a wiſh that application be made to Parliament for a repeal of thoſe acts.

On a further examination into this buſineſs, Dr. Jackſon informed the Society that

that he had cultivated tobacco in Scotland, and that in the counties of Roxburgh, Berwick and Selkirk, a thouſand acres were planted laſt year, and a ſample of Tobacco prepared from thoſe plants, was produced, which appeared to be of a good kind.

That a light rich deep ſoil, is the moſt proper for the culture of it—that it prepares the ground well for Wheat, of which he has always had a good crop after it, and that from ſix acres, he obtained ſix thouſand pounds weight, value one ſhilling the pound.

It is plain from the foregoing information, that Tobacco might be cultivated to advantage in Great Britain, but it is not at preſent allowed to be planted, on account of two Acts of Parliament, which paſſed in the Twelfth, the Twenty-ſecond and Twenty-third years of the reign of Charles II.

THE Pictures painting, in the Society's Great Room, by James Barry, Eſq; profeſſor of painting to the Royal Academy, of which ſome mention is made, in Vol. I. page 60, being brought to ſuch a ſtage as the Artiſt judged proper to exhibit them to the Public. A letter was received from him, inviting the Society to a view of the work, before ſuch exhibition took place.

Thanks were given to Mr. Barry for his polite invitation, and the Society met accordingly, and having viewed the pictures, came to the following reſolution:

"That the ſeries of Pictures illuſtrat-
"ing in their deſign, the progreſs of hu-
"man knowledge, and the advancement
"of uſeful and elegant Arts, from a very
"early period, to the preſent æra, is a
"work of great excellence of compoſi-
"tion, maſterly execution, and claſſical
"infor-

" information, and muſt be deemed a " national ornament, as well as a monu- " ment of the talents and ingenuity of the " Artiſt."

This reſolution, and the thanks of the Society, given unanimouſly to Mr. Barry, were ordered to be publiſhed in the News Papers.

After this, the Great Room of the Society was opened during two months, for a Publick Exhibition of the Pictures, for the advantage of Mr. Barry, towards defraying the expenſe, of which the Society voted the ſum of eighty-ſeven pounds; and as another exhibition of the ſame Work is intended this year, at the ſame expenſe, it is propoſed, in a future Volume of the Tranſactions, to lay before the Publick, a full deſcription of the ſeveral ſubjects of the pictures, and alſo the account of the proceedings on this

matter, with the ſums of money the Society have judged proper to expend, in encouraging the proſecution of this laborious and valuable work.

PRESENTS